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# PEABODY JOURNAL OF EDUCATION

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PEABODY JOURNAL OF EDUCATION

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# THE ENDURING FUNCTION OF THE CHANGING COLLEGE

PEYTON JACOB
Mercer University, Macon, Georgia

Champions of the liberal college are endeavoring to maintain its present form in the face of impending reorganization, while the real need is that its historic and essential function, already obscured, shall not be entirely lost in the present re-shuffling of units in higher education. It will matter little, socially, if the name and form of the present college disappear, but it will be a calamity if its work is not carried on; and the reorganization now rapidly getting under headway makes no definite provision for continuing this work.

American higher education has three distinct functions, but explicitly recognizes only two. The two definitely recognized functions are (1) professional and technical training and (2) research. The third is the unique though vaguely conceived function that until recently constituted the chief work of the liberal college. For lack of a suitable descriptive term we may speak of it simply as the *collegiate function*, a term which it is the central purpose of this paper to clarify.

Failure to recognize the collegiate function and to set the administrative unit responsible for it into proper relation to the other divisions has dislocated all the remaining units, and has left still other functions without institutional provision for their care. If we can discover the nature of the collegiate function and set it in proper relation to the other two functions and their subdivisions, the proper relations of all the administrative units will become evident. A suitable institutional set-up for performing each function may then be more easily formulated.

It is imperative that we think in terms of functions instead of institutional units, as functions cross over the dividing lines between institutions, and institutional units frequently include several functions. Academic specializa-

tion, for example, is divided between the college and the graduate school, as when a student continues the subject of his undergraduate major in the work for his master's or doctor's degree. On the other hand, the graduate school divides its attention between two related but separate functions, academic specialization and training in research.

We need to be on special guard against reading into the concept (collegiate function) the varied functions now being performed by the four-year college. The college even now provides much of the work that might, if definitely organized to that end, serve the collegiate function as this is herein conceived, but such a function is scarcely thought of and is given no definite recognition in the organization of the college program.

Analysis of the activities of the present arts college reveals at least four functions absolutely distinct from the one under consideration. One is the offering of broad general courses. Much work in the first year or two is devoted to a continuation of courses begun in high school or to the beginning of courses that may be taken either in high school or in college. Many institutions draw a sharp line of demarcation between the first two years and the last two, restricting this type of work to the lower division.[1] Experience with transcripts of students from many of the weaker colleges tends to show that work of the third and fourth years also frequently consists of courses that are essentially of the same type. A second function, academic specialization, equally distinct from the collegiate function, was named above. The third function, somewhat analogous to the second, is pre-professional training, which consists of academic courses preparatory for the technical courses of certain professions. The fourth, usually regarded, uncritically, as the central function of the liberal college, is a general, or cultural, or civilizing function.[2] Some, however, regard this as quantitatively and not qualitatively different from the general education of the secondary school. It is this function that seems so difficult to distinguish from the one with which we are here concerned.

The central fact to which we must hold firmly is that the collegiate education herein discussed is *special* and not *general*. As such it is distinctly "higher" education, at whatever educational level higher education may be

[1]The entire lower division plan of organization is an acknowledment on the part of the universities that the lower years of their present courses properly belong to secondary education."—Proctor, W. M. "The Place of the Junior College in Educational Reorganization," in Proctor, W. M. (Editor) *The Junior College.* Stanford University, California: Stanford University Press, 1927. p. 197.

[2]After examining two studies of the literature on college aims and collecting statements from college executives and alumni, F. J. Kelly states, "There is practically unanimous agreement . . . that the largest function of the college of arts and sciences is its liberalizing training for effective social and civic life, *outside one's vocation.*" (Italics ours)—Kelly, Frederick J. *The American Arts College.* New York: Macmillan Company, 1925. p. 152.

thought properly to begin. It is distinct in purpose from general or cultural education, however much it may draw from the same body of subject matter. If in the future the average citizen is able to devote four years above the present high school level to purely cultural education, there will still be need, beyond this higher level, for a non-technical (but in a sense professional) education of the type herein discussed. This is in a superficial way analogous to pre-professional education, but in fundamental respects it is absolutely different.

The collegiate function cannot be defined in terms of subject matter, or educational level, or the specific vocations to which it points. The subject matter is in many respects the same as that of secondary education, but the real college is more than an extended and glorified secondary school. The curricula have changed radically since the seventeenth century, but the old function persists, at least in some measure, along with the new functions that have been added. The educational level has varied with the times, but the college performed its function as truly when its level was no higher than that of the present high school. It was founded primarily for one vocational group, the ministry; but it has, without altering its essential character, gradually opened its doors to those looking to other professions.

The genetic approach seems to afford the best clue to the central and enduring function of such a changing institution.

"The American College," says Leon B. Richardson, "is the direct offshoot of the corresponding English institution of the seventeenth century."[3] Dr. Frederick Eby gives us an insight into the essential meaning of the parent institution in the following:

> "Higher education in England had differed essentially from every other in that it had always subordinated scholarship and learning to discipline and life. . . The college was the means by which the aristocratic class of England moulded the thought and manners of its youth and fitted them for the perpetuation of English institutions and ideals."[4]

Here *social control* seems to be the essential element. A similar conception of the social meaning of Oxford is expressed by Dr. Charles F. Thwing in the quotation below. We note, however, that the idea of social control is softened into what we may speak of as *influence for social continuity.*

> "Oxford is the best England raised to the highest power. It represents the conservativeness, the thoroughness, and the solidity of English life, character, institutions. In the shocks which our civilization is sure of meeting in the course of the forthcoming centuries, these qualities and elements which center in and radiate forth from Oxford can be rested back upon as forces which shall help to maintain civilization in a state of stable equilibrium."[5]

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[3] Richardson, Leon B. *A Study of the Liberal College.* Hanover, N. H.: Dartmouth College, 1924. p. 11.

[4] Eby, Frederick. *The Evolution of the College* (ms.). pp. 13-14.

[5] Thwing, Charles Franklin. *Universities of the World.* New York: Macmillan Company, 1911. p. 21.

We may say that the central idea behind the English college was training for social leadership, whether the conception of leadership was aristocratic or democratic.

The transplanted institution, the colonial college, had the same social meaning. To conceive it merely as a training school for ministers, as such a school is understood today, is to miss the point entirely. The minister of colonial days was the *central social figure*. The colonists implicitly believed that the perpetuity, as well as the guidance, of their social institutions was in his hands. An education to fit him for this service, as far as the times afforded, was provided.

Viewed in this light, the following inscription on the West Gate of Harvard University has an entirely different meaning from that usually ascribed to it.

"After God had carried us safe to *New England*, and we had builded our houses, provided necessaries for our liveli-hood, reared convenient places for God's worship, and setled the Civill Government: One of the next things we longed for, and looked after was to advance *Learning*, and perpetuate it to Posterity; dreading to leave an illiterate Ministery to the Churches, when our present Ministers shall lie in the Dust."[6]

In harmony with this larger social purpose, implicit in their religion, the education provided for their ministers was designed to give the largest social insight afforded by the available cultural material. Dr. W. H. P. Faunce, late President of Brown University, has stated this point clearly:

"Our oldest colleges were thus religious in motive and vocational in aim. But the vocation for which they prepared men was one of the broadest and most fundamental character. The Puritan preacher was conceived to be an authority on the deepest problems of this world and that which is to come. He was . . . political advisor, leader of civic life, and in Massachusetts and Connecticut he was an officer of the state. Such a man must have no mere technical training. He must be made to grapple with philosophical problems, be versed in the languages in which such problems were discussed, and must possess such power . . . as should equip him for his broad and varied task."[7]

The social implications of the minister's work, and of the education appropriate to it, are thus expressed by Dr. Alexander Meiklejohn:

"In the old colonial community the clergyman, as in lesser degree the lawyer and teacher, was the man of ideas. He was no mere teacher of the gospel and tender of the parish. While people lived their lives it was his task to reflect on living, to formulate the beliefs on which it was based; to study the conditions by which it was moulded; to bring to clearness the problems by which it was faced; to study the moral, social, economic, political situations for which it was constituted. It was his part and the part of men of like intellectual development to attempt to understand the lives which other men were living with lesser degrees of understanding. It was his task to serve as prophet and seer, as guide and counselor of his people. It was for that task that the liberal college was intended to prepare him."[8]

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[6]From "New England's First Fruits," quoted in Monroe, Paul, *Cyclopedia of Education*, article *Harvard University*.

[7]Faunce, W. H. P. "The Aim and Scope of the New England College," in Crawford, W. H. (Editor) *The American College*. New York: Henry Holt and Company, 1915. p. 3.

[8]Meiklejohn, Alexander. "The Function of the College as Distinct from the High School, the Professional School, and the University." In Crawford, W. H., *op cit.*, p. 164.

The function of the early college in training for social leadership is further revealed by the fact that those looking toward social-leadership professions other than the ministry soon began to appropriate the training offered by the college. Such training as was given the minister, it was held from the very beginning, might be useful for many other men whose task was of broad and general character.

"The charter of Yale University, the Collegiate School of Connecticut, describes it as a school 'wherein youth may be instructed in the arts and sciences, who through the blessing of Almighty God may be fitted for Public employment both in Church and Civil State.' "[9]

It was early held that what was good for the minister was good also for the prospective lawyer or teacher or even doctor.

The collegiate function persisted through the period of French influence and the rise of the State Universities. When the French influence became strong after the American Revolution, and the State Universities arose, the same general concept of the social-leadership function of higher education persisted, *except* that social leadership was passing more and more from the minister to other professions. Speaking of the new State universities, Eby says ". . . in place of functioning as seminaries for the training of preachers, they had in view the making of lawyers, jurists, legislators, governors, doctors and other professional servants of the state."[10]

Later developments obscured the original and unique function of the liberal college, but for two centuries or more its real meaning was implicitly recognized, even if not explicitly stated, as is shown by the type of students who sought training in it. This function was that of *giving the basic training for the professions concerned with social leadership.*

The subject matter appropriate to education for social leadership changes with the educational level of the masses. The knowledge that in one age is adequate equipment for leadership may in the next age be necessary for social membership. As long as the masses were illiterate, literacy, with the greater social insight it afforded, tended to qualify for social leadership; but when literacy, having spread to the majority, was needed for adequate social membership, it thus dropped to the level of secondary education. Now that most of the ordinary activities of life involve reading, reading is an elementary subject. In the seventeenth century an acquaintance with classical literature, because of the insight it gave into social institutions, probably afforded the best available training for social leaders; though no less important than the *formal curriculum* was the *informal education* resulting from the extra-curricular activities fostered by the common social purpose of the highly selected student body and faculty. At any rate the classics continued as the formal basis of such training until the advent of the elective system,

[9] Meiklejohn, Alexander, *op. cit.*, p. 154.
[10] Eby, Frederick., *op cit.*, p. 12.

which was approximately coincident with the founding of Johns Hopkins.[11] From that time on the partial and intermittent social insights to be gained from the mosaic of liberal arts courses were to serve the same purpose more or less adequately.

The next step in the evolution of a purely collegiate curriculum would logically have been the introduction of subject matter of direct and overt, instead of merely incidental, reference to social institutions and processes. But the time was not ripe. The social sciences, which must be drawn upon for the central part of such a curriculum, were not yet developed. The natural sciences gained the ascendancy and pointed toward technical education; and the college gradually relinquished its characteristic and historic function. It was becoming a secondary school unawares, as much because the general level of education was rising as because it had changed its program.

An event in educational history conspired with the above to fix the status of the college as a secondary school. In 1876 Johns Hopkins University was founded on the model of the German research school, and soon other institutions established similar schools for research. Now it will be remembered that the German university is planted squarely upon the secondary school, the *gymnasium*, and not upon any type of collegiate institution. The English prototype of the college is also based upon the secondary school. The English college and the German university are thus of approximately parallel rank but of entirely different function. The logical procedure would have been to place the new institution on the same level as the college, had not the college already lost, somewhat, its status as a higher institution. Both in educational level and in type of work, however, the college at that date approximated the German gymnasium, and the new school of research was planted on top of the college to become a "graduate" school.

The college has since then had vitality enough to push upward, carrying the graduate school with it and unduly prolonging general education; but it has not had the insight to formulate a program of genuinely higher education for carrying out its original and peculiar function, which should make it of rank equal with, and not perparatory to, the graduate and professional schools.

Now three circumstances combine to give the college an opportunity to resume the line of development from which it was diverted over a half century ago. First, the social sciences now afford a body of material suitable for the central core of a definitely collegiate curriculum. Second, the growing complexity of society creates a need not heretofore felt for highly trained social leaders, whose education should be relatively as far above the general level as that given by the old colonial college was above the level of its day.

[11]Charles W. Eliot became President of Harvard in 1869.

Third, the reorganization movement is drawing a clear line of demarcation between secondary and higher education, and should sooner or later draw clearer lines between the several functions of higher education. This should relieve the college of secondary education as well as those aspects of higher education which are foreign to its real business, and allow it to concentrate on its one supremely important task.

The chief ingredients of the training for social leadership must come from the social sciences, though the curriculum should not be confined to academic specialization in one, or even several, of these. Specialization in government or economics or sociology would seem to have somewhat the same relation to social leadership that specialization in biology or chemistry has to medicine. In either case the materials supplied by the pure sciences must be combined with various other materials before they can be applied. Moreover, social leadership involves more than the mere *mechanics* of social institutions and processes. There must be insight into and appreciation of the *human values* for the conservation and promotion of which social institutions were set up. Along with technical social science there should be literature and art, philosophy and religion, and anything else helping to largeness of vision and quickening of sympathy and insight.

President Homer P. Rainey, of Franklin College, in delimiting fields of study appropriate to the arts college, while not explicitly recognizing this function, indicates the training appropriate for social leadership.

> "It (the liberal college) must, as it has always done, center its attention upon human and social values. Our great fields of study, therefore, are necessarily sociology, politics, government, psychology, and most of all religion, because in religion we are to find the highest objectives of human destinies and it is commonly believed that the principles of Christianity afford the only basis for a human society which shall be able to attain the highest objectives of the human race."[13]

Like most champions of the present four-year arts unit, however, President Rainey fails to distinguish between training for adequate social membership, which is the birthright of all possessing average intelligence, and training for social leadership, *which can not be forced upon* any except that elect group whose social vision and generous interest almost automatically set them aside—without overmuch mechanical sifting—for the highest type of social service.

A similar confusion between education for general culture and education for social leadership is betrayed in an otherwise excellent article, "The Future of the Liberal Arts College," by Daniel J. Cowling, President of Carleton College.

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[13]Rainey, Homer P. "The Crisis in Liberal Education," *School and Society*, XXVIII (September 1, 1928), pp. 254-5.

"The aim of a college is just as definite as that of any professional school. That aim is to develop the student with respect to all his capacities into a mature, symmetrical, well-balanced person, in full possession of all his powers, physical, social, mental, and spiritual, with an intelligent understanding of the past and a sympathetic insight into the needs and problems of the present."[13]

The above describes a very high type of education for personal culture, such as any individual might wish for himself, regardless of vocation. It also implies preparation for adequate social membership, through "intelligent understanding of the past and sympathetic insight into the needs and problems of the present." These phrases hardly imply, however, the thorough knowledge of social institutions and processes necessary for social leadership in our increasingly complex civilization. To acquire such knowledge requires special study analogous to that required by the professional schools.

It is very important to keep clear the distinction between collegiate and general or secondary education. If the liberal college disappears, it will probably do so from failure to make that distinction. Secondary education may be regarded as the orientation of a youth with respect to himself and with respect to all phases of his environment, physical and social, with the social environment given the major emphasis. This is simply an obverse way of stating the central concept in Greek liberal education, which is the development of personality.[14] Collegiate education as herein defined is directly concerned with only one phase of the environment, the social; and it treats this, moreover, from a different point of view. The distinction between secondary and collegiate education, at this point where their fields overlap, is that between education for social membership and education for social leadership. To adapt a phrase from Snedden, we may characterize them as education for consumption and education for production. Consumers in this sense include not only those who make material use of social institutions and products, but also those who properly understand and appreciate them. Producers are all those engaged in the administration, the interpretation, the criticism, or the reconstruction of the institutions of society.

It is equally important to distinguish the collegiate from the other functions of higher education. We may subdivide professional training into two types, (a) liberal and (b) technical. We may also discriminate a service now divided between the college and the research school, academic specialization. This gives us five types of service, which we may rearrange as follows:

1. Training research workers.
2. Training subject-matter specialists.

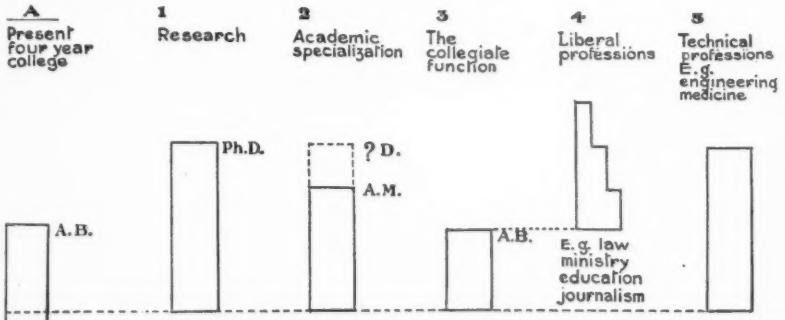
[13]Cowling, Daniel J. "The Future of the Liberal Arts College." In Hudelson, Earl (Editor). *Problems of College Education.* Minneapolis, Minn.: The University of Minnesota Press, 1928. p. 395.

[14]Cf. Kandel, I. L. History of Secondary Education. New York: Houghton Mifflin Company, 1930. Chap. I.

3. Preparation for the liberal professions: (a) *collegiate training.*
4. Preparation for the liberal professions: (b) *specific technique.*
5. Preparation for the technical professions.

## INTERRELATIONSHIPS OF EDUCATIONAL FUNCTIONS

(Not administrative units)




The dotted line represents the close of the period of general education. It is so drawn as to represent the prevailing conception that general education normally closes at the end of the sophomore year. The same general relationships between the different functions obtain, however, regardless of the level at which general education may be considered to close.

A The present four-year college devotes the first two years chiefly to work of a general nature. The last two years are devoted to a variety of programs, usually specialized, as outlined in the accompanying paper.

1 Under the reorganization scheme, first effected at Johns Hopkins, the Ph.D. is to represent, normally, four years of training for research (part of which is of course academic specialization) beyond the junior college, instead of three years beyond the A.B.

2 Academic specialization is now divided between the senior college and the graduate school, to the confusion of both. George Washington University separates *1* and *2*, as is suggested above.

3 The collegiate function, as defined in this paper, is not definitely provided for in any scheme of organization. It may be secured by the student of initiative, of course, in many extant institutions, but the student must organize his own course, and lose much time, on account of hampering regulations.

4 The liberal professions require less technique, but more training of the collegiate type. The amount of technique needed varies from less than a year, for journalism, to three, as in law. All should be based upon, or carried parallel to, collegiate training as herein defined.

5 The technical professions include all types of engineering, agriculture, mining, etc., and probably medicine.

Some interrelations of these may be noted.

The training of subject-matter specialists has absorbed so much of the energies of both the senior college and the graduate school that the strictly collegiate work of the former and the research function of the latter have both been obscured. Suzzallo asserts that "the graduate school is now filled

with people without interest in research."[15] The reason is evident: there is great social demand for such training, and no unit has been organized specifically to meet the demand. Such a unit may easily be developed by extending the upper division of the present college. Dean Ford, of the Graduate School of the University of Michigan, points out such a possibility:

> "The question has been raised, and may well be raised, whether the Master's degree is not becoming a degree for administration by the undergraduate faculty. You would then have graduate schools that were interested only in candidates for the Ph.D., those who want to do, essentially, research and teaching on the higher level."[16]

The M.A. degree might represent three years of academic specialization above the junior college, without interruption for the A.B. and without dilution by technical work or a miscellany of essentially secondary courses. The A.B. might then be reserved as the label for those who spend two or more years in the type of collegiate study discussed in this paper. Either degree should be available without the other. Possession of both degrees would simply denote two distinct types of training, and these could not be telescoped.

What we here call the liberal professions are those concerned directly with the administration, interpretation, or criticism of social institutions. Some of these are the ministry, education, journalism, public service. Law has always had social implications, and now seems to be moving toward full acceptance of its social responsibility. Business should be included if it becomes professionalized.

The basic training for the liberal professions is "collegiate" in the sense we have defined the term. The professional content peculiar to each averages less than in the technical professions; but even when it is extensive the college can not become subsidiary thereto, as through the "service function," without relinquishing its essential character.[17] The college would be distorting its purpose, for example, to give work in economics or government from the pre-legal point of view, or Greek and Hebrew for future preachers, or advanced chemistry and biology for pre-medical students. In other words, we may say that in the liberal professions the collegiate work is primary. Instead of its being subordinate to technique, *technique is subordinate to purposes which the college sets up*. The technical courses might well be given *pari passu* with the collegiate work, instead of subsequently. This is most easily seen, perhaps, in the case of journalism.

The technical professions are not, *as such*, concerned with the social implications of their work, and may properly devote all the time above the

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[15] Suzzallo, Henry. "The Training of Junior College Teachers." In *American Association of Junior Colleges, Proceedings of the Tenth Annual Meeting*. p. 102.

[16] Ford, Guy Stanton. "The Function of the Graduate School." In Hudelson, Earl, *op. cit.*, p. 181.

[17] Cf. Kelly, Frederick J., *op. cit.*, p. 54.

secondary level to the acquisition of technique, of which more is required than in the liberal professions. The engineer, for example, is concerned with the social implications of a great project that he is directing only as any other good citizen. The statesman who has included the project in his program is concerned *professionally* with its social implications. Only false analogy has led to the demand that both types of professions should begin their special training at the same level. The level at which each properly begins varies with the changing level of general education, but their *relative* position remains constant. In so far as the level now usually accepted for general education is correct, the liberal professions are properly based on the college and the technical professions on the secondary school—i. e. the present junior college.

The institutional set-up and curricular organization for this type of education are not primary but are important considerations. The primary requisite is that those in charge of the educational policies shall clearly envisage the objectives of this type of training. The senior division of the traditional four-year college might be recognized to perform this function, provided there is no confusion with other functions, such as the secondary work of its junior division or the variety of irrelevant services now performed by its senior division. The new type of honors courses in the senior division, with a field of concentration in the new humanities *and with the collegiate point of view,* offers a peculiarly suitable academic organization, however the administrative unit is placed. The chief, though not the only, virtue of this organization lies in its tendency to break down the middle wall of partition between subjects. Academic specialization can not prepare for social leadership, even though it be in the social sciences.

> "It has been one of the primary purposes of the honors system at Swarthmore to avoid piecemeal perception. From the start the aim has been to impress upon the student that he is studying a subject in all its parts and in its relations to other subjects of a closely similar character; . . ."[12]

A better set-up than an isolated unit would be an institution growing out of a traditional four-year college, in which the junior division is eliminated or definitely separated, and in which, surrounding or topping the senior division, are grouped the schools giving the definitely professional material of the social-leadership professions. Another unit devoted to academic specialization, but entirely different in spirit and purpose from the collegiate work, should be included.

This would give us a small university covering the three functions indicated by numbers *2, 3,* and *4* on the accompanying chart. Varying combinations could be worked out to meet peculiar needs. For example, a teachers'

[12]Brooks, Robert C. *Reading for Honors at Swarthmore.* New York: Oxford University Press, American Branch, 1927. pp. 23-24.

college would need units for functions *2* and *3* plus a professional school of education. Schools for research in education, as distinguished from professional schools preparing for practice, however, would properly be restricted to the larger teachers' colleges or universities serving an entire state or group of states. The collegiate unit would be needed for training those who, as far as can be foreseen, are to become directors of educational institutions and policies rather than either academic specialists or technicians.

Transforming a number of our stronger independent colleges into small universities of this type should have several wholesome effects upon higher education. First of all it should revive and restore to its central place the historic function of the college, articulating with the college those units that perform allied services and transferring irrelevant functions to other divisions. It should attract more homogeneous and purposeful student bodies than now attend the arts colleges. It should relieve the pressure upon the graduate (research) schools. The entire system of higher institutions could be better located geographically, with the graduate and technical schools left to serve wider areas.

# DIAGNOSTIC AND REMEDIAL TREATMENT IN ARITHMETIC

DENNIS H. COOKE
George Peabody College for Teachers

This article is written for elementary school principals and teachers who are face to face with the question of what can be done to reduce the number of failures in the subject of arithmetic, and to eliminate as many as possible of the difficulties which interfere with pupil progress in arithmetic. It is a write-up of the technique used and the results secured in diagnosing and remedying the difficulties of a small group of fifth grade pupils in the Peabody Demonstration School.

The diagnostic work was begun with the beginning of the winter quarter in Peabody College and the beginning of the second semester of the Peabody Demonstration School. At approximately the middle of January, 1931, the six poorest pupils in arithmetic (as judged by a combination of several standardized achievement tests in arithmetic, the teacher's marks for the first semester, and the teacher's judgment of the pupils) in the fifth grade of the Peabody Demonstration School were selected for diagnosis of difficulties in arithmetic. This study was made with the assistance of graduate students in Education. The tests used in the diagnosis are indicated in Table II. In addition to these tests a Buswell-John Diagnostic Chart for Individual Difficulties in the Fundamental Processes of Arithmetic was used with each pupil. The individual difficulties of each pupil are tabulated in Table I. The first period of testing continued until approximately the fifteenth of January. The scores for this testing period are headed February first in Table II.

A written report of this diagnosis along with some suggestions for remedial measures for each case was made to the regular fifth grade teacher on March fifteenth. The teacher was asked to carry out in the regular classroom instruction the suggestions made concerning the remedial measures for all cases except cases I and III. To these cases she was to give no special remedial attention.

From approximately the fifteenth of May until the fifth of June a second diagnosis of five of the cases (the sixth having missed so many tests that he was dropped from the study) was made, applying different forms of the same tests and the diagnostic chart. The data for this diagnosis are headed June first in Tables I and II. During and between the first and second diagnoses the regular classroom instruction in arithmetic was carried on by

the fifth grade teacher. Between these two diagnoses special attention was given to cases I and III. An attempt was made to help these pupils to overcome as many as possible of their arithmetical difficulties. Each of these cases was given individual attention daily for thirty minutes, for four days each week, over a period of six weeks. The type of remedial work attempted with Cases I and III is described in a later section of the report.

Beginning the fifteenth of June and continuing through the fifteenth of August individual remedial instruction was given to each of the five cases for the purpose of eliminating as many as possible of their arithmetical difficulties. Each pupil was given individual attention during this period for thirty minutes each day for three days each week. During this second period of remedial instruction Cases III and IV were enrolled in the Peabody Demonstration Summer School. The other three cases were not in school. However, none of the students were given any instruction in arithmetic except the special remedial work three times each week. From August fifteenth to September first a third diagnosis was made, using different forms of the same tests and the same diagnostic chart for individual difficulties. The data are presented under the caption September first in Tables I and II.

TABLE I

SHOWING THE INDIVIDUAL DIFFICULTIES OF THE FIVE DIAGNOSTIC CASES FOR EACH OF THE THREE DIAGNOSES AS REVEALED BY THE BUSWELL-JOHN DIAGNOSTIC CHART FOR INDIVIDUAL DIFFICULTIES IN THE FUNDAMENTAL PROCESSES OF ARITHMETIC

| TYPES OF ERRORS AND DIFFICULTIES | Case I | | | Case II | | | Case III | | | Case IV | | | Case V | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F1[1] | J1[2] | S1[3] | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | |
| ADDITION: | | | | | | | | | | | | | | | | |
| Shifting from one problem to another | x | x | | | | | | | | | | | | | | 2 |
| Special difficulty with combinations containing "7" | x | x | | | | | | | | | | | | | | 2 |
| Counting to get sum | | x | | x | x | | x | x | x | x | x | | x | x | | 10 |
| Working problems on a page in column order instead of rows | | x | | | | | | | | | | | | | | 1 |
| Inconsistent in the order of adding one number to another | | x | | | | | | | | | | | | | | 1 |
| Repeating work after partly done—especially with columns of figures | | | x | | | | | | x | | | x | | | | 3 |
| Grouping two or more numbers in an unnatural order | | | x | | | | | | | | | | | | | 1 |

[1]February 1st. [2]June 1st. [3]September 1st.

TABLE I—(Continued)

| Types of Errors and Difficulties | Case I | | | Case II | | | Case III | | | Case IV | | | Case V | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | |
| Inconsistent in adding in carried number first and last | | | | x | x | | | x | | | | x | x | x | | 6 |
| Inconsistent in adding up and down | | | | x | | | | | | | | | | | | 1 |
| Counting on fingers | | | | x | x | | x | x | | | | | | x | | 5 |
| Errors in a large number of combinations | | | | x | x | x | x | x | | x | x | | x | x | | 9 |
| Adding numbers horizontally instead of vertically | | | | | | | | x | | | | | | | | 1 |
| Deriving unknown combinations from familiar ones | | | | | | | | | x | | | | | | | 1 |
| Splitting numbers, securing units of five's, ten's, etc., in the adding process | | | | | | | | | | x | x | | x | x | | 4 |
| Repeating the sum with each new combination | x | | | | x | | | x | | | | | | x | | 4 |
| Subtraction: | | | | | | | | | | | | | | | | |
| Errors in a large number of combinations | x | | | x | x | | | | | x | x | | x | x | | 7 |
| Adds the last digit instead of subtracting it | | | | x | | | | | | | | | | | | 1 |
| Not allowing for having borrowed | | | | x | | | x | | x | x | x | | x | | | 6 |
| Failing to bring down a digit | | | | | x | | | x | | | | | | | | 2 |
| Failing to borrow | | | | | | | x | | | | | | | | | 1 |
| Errors due to zero in minuend | | | | | | | x | x | x | | | | | | | 3 |
| Counting to get remainder | | | | | | | | | x | | | | x | | | 2 |
| Subtracting same number in subtrahend from two numbers in minuend | | | | | | | | | x | x | | | | | | 2 |
| Special difficulty with combinations containing "9" | | | | | | | | | | | x | | | | | 1 |
| Adding instead of subtracting | | | | | | | | | | | x | | | x | | 2 |
| Splits combinations and numbers | | | | | | | | | | | | | x | x | | 2 |
| Counting on fingers | | | | | | | | | | | | | | | x | 1 |
| Multiplication: | | | | | | | | | | | | | | | | |
| Errors in large number of combinations | | | | x | | | x | x | x | x | x | x | x | x | x | 10 |
| Counting to get product | | | | x | | | | | | | | | x | | | 2 |
| Failing to bring down zero in product | | | | | x | | | | | | | | | | | 1 |

TABLE I—(Continued)

| Types of Errors and Difficulties | Case I | | | Case II | | | Case III | | | Case IV | | | Case V | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fl | Jl | Sl | Fl | Jl | Sl | Fl | Jl | Sl | Fl | Jl | Sl | Fl | Jl | Sl | |
| Errors due to zero in multiplicand and multiplier | | | | | x | | x | x | x | x | x | x | x | x | | 9 |
| Misplacing the numbers brought down in the product | | | | | x | | x | x | | | | | | | | 3 |
| Special difficulty with combinations containing "7" and "9" | | | | | x | | | x | | x | x | | x | x | x | 7 |
| Errors in addition | | | | | | x | x | | | | | | | x | | 3 |
| Securing multiplication combinations by adding | | | | | | | | | x | | | | | | | 1 |
| Deriving the unknown combinations from the familiar ones | | | | | | | | | | | | | x | x | | 2 |
| Counting on fingers | | | | | | | | | | | | | | | x | 1 |
| Division: | | | | | | | | | | | | | | | | |
| Failing to bring down zero when it wouldn't go | x | | x | | | | | | | | | | | | | 2 |
| Special difficulty with combinations containing "7" | x | | | | | | | | | | | | | x | | 2 |
| Errors in multiplication combinations | | | x | x | | | x | x | x | x | x | | x | x | x | 10 |
| Used long division form for short division, and *vice versa* | | | x | | | | | | x | | | | x | | | 3 |
| Failing to bring down the remainder | | | | x | | | | | | | | | | | | 1 |
| Counting on fingers | | | | | x | | | | | x | x | | | | x | 4 |
| Failing to reduce fractions to lowest terms | | | | | x | | | | | | | | | | | 1 |
| Counting to get quotient | | | | | | | x | x | | | | | x | | | 3 |
| Special difficulty with odd quotients | | | | | | | x | x | | | | | | | | 2 |
| Finding quotient by adding | | | | | | | x | x | | | | | | | | 2 |
| Reversing dividend and divisor | | | | | | | x | x | | | | | | x | | 3 |
| Errors in subtraction | | | | | | | | | | x | x | x | | | | 3 |
| Finding quotient by trial multiple | | | | | | | | | | x | x | | | | | 2 |
| In subtracting, confuses subtraction with addition | | | | | | | | | | x | | | | | | 1 |
| Using wrong process | | | | | | | | | | | | | x | | | 1 |
| Omitting digit in dividend | | | | | | | | | | | | | x | | | 1 |
| Using a remainder larger than the divisor | | | | | | | | | | | | | x | | | 1 |
| Total | 6 | 5 | 5 | 12 | 13 | 2 | 15 | 17 | 12 | 14 | 14 | 5 | 19 | 18 | 5 | 162 |

TABLE II

SHOWING THE INDIVIDUAL SCORES OF THE FIVE DIAGNOSTIC CASES FOR EACH OF THE THREE DIAGNOSES

| TESTS | Form | Norms | | Scores | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Case I | | | Case II | | | Case III | | | Case IV | | | Case V | | |
| | | 5A | 6B | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 | F1 | J1 | S1 |
| COMPUTATION: | | | | | | | | | | | | | | | | | | |
| Public School Achievement (b) | 3 | 31 | 45 | 28 | | 34 | 31 | | 32 | 22 | | 30 | 29 | | 33 | 31 | | 28 |
| " " " | 4 | 37 | 43 | | 39 | | | 34 | | | 21 | | | 31 | | | 31 | |
| Stanford Achievement | A | 95 | 103 | 92 | | 104 | 104 | | 104 | 72 | | 80 | 92 | | 100 | 104 | | 104 |
| " " | B | 95 | 103 | | 88 | | | 88 | | | 84 | | | 88 | | | 84 | |
| ADDITION: | | | | | | | | | | | | | | | | | | |
| Cleveland Survey | 1 | 34.3 | | 19 | | 26 | 26 | | 46 | 18 | | 27 | 16 | | 34 | 19 | | 30 |
| " " | 2 | 36.6 | 42.4 | | 18 | | | 20 | | | 20 | | | 23 | | | 20 | |
| Woody Arithmetic Scales B | | 14.0 | 16.0 | 10 | | 14 | 15 | | 12 | 7 | | 13 | 14 | | 15 | 14 | | 13 |
| " " " | II | 14.0 | 16.0 | | 14 | | | 15 | | | 13 | | | 15 | | | 15 | |
| SUBTRACTION: | | | | | | | | | | | | | | | | | | |
| Cleveland Survey | 1 | 24.9 | | 12 | | 22 | 16 | | 45 | 10 | | 21 | 13 | | 19 | 13 | | 18 |
| " " | 2 | 27.4 | 28.3 | | 13 | | | 16 | | | 12 | | | 11 | | | 11 | |
| Woody Arithmetic Scales B | | 10.0 | 12.0 | 9 | | 11 | 10 | | 33 | 8 | | 7 | 10 | | 13 | 10 | | 10 |
| " " " | II | 10.0 | 12.0 | | 10 | | | 10 | | | 10 | | | 11 | | | 9 | |
| MULTIPLICATION: | | | | | | | | | | | | | | | | | | |
| Cleveland Survey | 1 | 23.8 | | 11 | | 15 | 19 | | 39 | 6 | | 21 | 10 | | 12 | 15 | | 33 |
| " " | 2 | 25.7 | 28.4 | | 9 | | | 14 | | | 8 | | | 8 | | | 16 | |
| Woody Arithmetic Scales B | I | 11.0 | 15.0 | 7 | | 13 | 15 | | 11 | 5 | | 6 | 9 | | 8 | 9 | | 11 |
| " " " | II | 11.0 | 15.0 | | 11 | | | 11 | | | 5 | | | 11 | | | 8 | |
| DIVISION: | | | | | | | | | | | | | | | | | | |
| Cleveland Survey | 1 | 24.5 | | 11 | | 31 | 23 | | 37 | 9 | | 12 | 11 | | 18 | 11 | | 30 |
| " " | 2 | 28.2 | 31.7 | | 15 | | | 24 | | | 6 | | | 14 | | | 13 | |
| Woody Arithmetic Scales B | | 7.0 | 10.0 | 8 | | 10 | 8 | | 10 | 4 | | 5 | 5 | | 8 | 6 | | 11 |
| " " " | II | 7.0 | 10.0 | | 8 | | | 8 | | | 6 | | | 7 | | | 9 | |
| FRACTIONS: | | | | | | | | | | | | | | | | | | |
| Cleveland Survey | 1 | | | | | 8 | 5 | | 14 | 2 | | 11 | 2 | | 6 | 1 | | 21 |
| " " | 2 | 9.8 | 11.6 | | 7 | | | 4 | | | 7 | | | 1 | | | 1 | |
| MIXED FUNDAMENTALS: | | | | | | | | | | | | | | | | | | |
| Woody McCall | I | 19.9 | 22.0 | 17 | | | 23 | | | 14 | | | 21 | | | 14 | | |
| " " | II | 19.9 | 22.0 | | 24 | | | 19 | | | 15 | | | 21 | | | 24 | |
| " " | III | | | | | 20 | | | 23 | | | 17 | | | 17 | | | 22 |
| REASONING: | | | | | | | | | | | | | | | | | | |
| Public School Achievement (c) | 3 | 19 | 22 | 16 | | 26 | 11 | | 23 | 7 | | 9 | 13 | | 20 | 13 | | 17 |
| " " " | 4 | 20 | 23 | | 21 | | | 20 | | | 10 | | | 20 | | | 15 | |
| Stanford Achievement | A | 55 | 61 | 48 | | 84 | 48 | | 44 | 40 | | 60 | 56 | | 64 | 60 | | 64 |
| " " | B | 55 | 61 | | 68 | | | 52 | | | 36 | | | 44 | | | 56 | |
| INTELLIGENCE: | | | | | | | | | | | | | | | | | | |
| Otis self-Administering Intelligence Quotient | A | | | 111 | | 109 | 112 | | 114 | 86 | | 85 | 102 | | 108 | 100 | | 112 |

## INDIVIDUAL DIFFICULTIES IN THE FUNDAMENTAL OPERATIONS

Table I shows the types of errors, with the frequency of occurrence, made by the five cases in addition, subtraction, multiplication, and division, with each of the three diagnoses. A total of 162 errors occurred during the fifteen different testings (each of the five cases being tested on three different diagnoses).

Taking the five cases as a whole, it appears from Table I that there has been a decided decrease with each case in the total number of errors occurring between the first and the third diagnoses. For example, Case I made six different types of errors on February first and only five on September first, Case II twelve on February first and two on September first, and Case III made fifteen and twelve, respectively. However, these figures are not necessarily very significant. Some errors are more serious in point of view of achievement than others. A reduction in the number of different types of errors does not necessarily mean an unusual amount of improvement—especially since new errors develop as old ones are eliminated. Therefore, it is necessary that the types of errors of each individual case be analyzed.

Table I indicates that some difficulties have been eliminated, while others have developed. A discussion of the types of remedial measures attempted in eliminating specific difficulties should prove profitable to elementary school principals and teachers. The following form was worked out for the purpose or recording the types of remedial instruction given:

### REMEDIAL TREATMENT IN ARITHMETIC

Name of pupil_____

Date of remedial work_____

Hours of remedial work_____

Difficulty to overcome_____

_____

_____

Remedial work done by_____

Description of the way in which this remedial work was carried on_____

_____

_____

_____

_____

_____

### CASE IV

*Difficulty:* Splitting numbers, securing units of five's, ten's, etc., in the adding process.
*Remedy:* When told the difficulty that the instructor wanted him to overcome, this pupil said that he added in that way because it was quicker. When he was told that it

was really quicker to use the addition combinations that he knew, he ceased to split numbers. However, the process became slower for the time being. After some time had been spent on oral drill in the addition facts, the process was faster with this student than it was by splitting numbers. Oral drill seemed to be as effective as written in eliminating this difficulty.

*Time required:* Three thirty-minute instruction periods.

### CASE V

*Difficulty:* Unusual number of errors in addition, subtraction, multiplication, and division combinations. (This pupil's chief source of difficulty).

*Remedy:* Incessant written and oral drill on the combinations with which this pupil had the greatest difficulty, as determined by a combination of the reaction time to and number of errors in all the combinations. (Practically all combination difficulties were eliminated in addition and subtraction. However, there is much to be done yet in multiplication and division).

*Time required:* Four thirty-minute instruction periods.

### IMPROVEMENT OVER THE SEVEN-MONTHS PERIOD

Table II shows the improvement or lack of improvement in standardized scores over the entire period of the study. With the beginning of the second semester of the Peabody Demonstration School the fifth grade would be properly classified as a 5-A grade. Case I scored below the norms of the 5-A grade on all tests except the division section of the Woody Arithmetic Scales. Case II either equalled or excelled the norms in both computation tests, and the addition, subtraction, multiplication, and division sections of the Woody Arithmetic Scales. Case III scored below the norms in all tests. Case IV exceeded the norms in the addition and subtraction divisions of the Woody Arithmetic Scales, in the Wood-McCall Mixed Fundamentals, and in the reasoning division of the Stanford Achievement Arithmetic Test. Case V exceeded the norms in both computation tests, in the arithmetic and subtraction divisions of the Woody Arithmetic Scales, and the reasoning division of the Stanford Achievement Test. With these few exceptions, all initial scores were below the norms for the 5-A Grade.

With the exception of Case III, all students had an intelligence quotient of normal or above. The intelligence tests showed that Case III is slightly below the normal in ability. These initial data indicate that a group of normal pupils have not achieved normally in the fundamentals of arithmetic.

However, by either the June or the September testing Case I had reached or exceeded the norms in all tests except the addition, subtraction, and multiplication divisions of the Cleveland Survey Test. In the other tests of the fundamentals Case I reached or exceeded the norms. Case II had reached or exceeded the norms in all tests except the Stanford Achievement Reasoning Test. Case III, scoring the lowest among the five cases on the initial tests, had attained the norms in only the subtraction division of the Woody Arithmetic Scales, the division on fractions of the Cleveland Survey Test, and the reasoning division of the Stanford Achievement Test. Case IV had reached the norms in all tests except the subtraction, multiplication, division, and

fractions sections of the Cleveland Survey Test and the Public School Achievement Reasoning Test.

It should be noted that all cases, except Case II, failed to reach or exceed the norm in one or more divisions of the Cleveland Survey Test. These norms have been based upon an average of the standards for this test as found in St. Louis, Missouri, and Grand Rapids, Michigan. Perhaps the unsatisfactory nature of such norms accounts for the pupils failure to attain them.

## SOME GENERAL CONCLUSIONS

1. Individual remedial instruction was more profitable than remedial instruction to a group of pupils. In all cases the pupils achieved more in arithmetic when they were given individual remedial instruction than they achieved when the remedial work was attempted in the course of the regular classroom instruction in arithmetic—even when considerably less time was given to the individual remedial work than was given to the regular arithmetical instruction.

2. Cases I and III achieved more in arithmetic during their second individual remedial-instruction period (in the absence of classroom instruction) than they did during their first remedial-instruction period in addition to their classroom instruction in arithmetic.

3. Two remedial-instruction periods (not instructional periods) were necessary to bring about as much gain in achievement in Case III (IQ 86) as one remedial-instruction period produced in Cases IV and V.

4. Pupils with unusual difficulties in a given process (addition, subtraction, multiplication, and division) scored relatively low in this process on the standardized tests. However, the gain in achievement was greatest in the processes in which the pupils were given the most remedial instruction.

5. At the beginning of the study three of the five pupils had a distinct dislike for arithmetic. However, with the elimination of some of their difficulties, they made progress. With progress there was developed a favorable attitude toward arithmetic by each of these three pupils.

6. Although all the pupils have improved considerably in their arithmetical achievement as a result of the elimination of some of their difficulties in arithmetic, no one as yet has reached the 6-B norms on all of the achievement tests used. Additional individual remedial work should be carried on with each of the cases.

7. The following errors and difficulties should be eliminated:[1]

[1]It is the plan to continue this remedial work with the five pupils in question.

| | Cases | | | | |
|---|---|---|---|---|---|
| | I | II | III | IV | V |
| **Errors and Difficulties in Addition:** | | | | | |
| Counting to get sum | | | x | | |
| Repeating work after partly done—especially column addition | x | | x | x | |
| Grouping two or more numbers | x | | | | |
| Inconsistent in adding carried number first and last | | | | x | |
| **Errors and Difficulties in Subtraction:** | | | | | |
| Errors in combinations | | x | | | |
| Deriving unknown combinations from former ones | | | x | | |
| Not allowing for having borrowed | | | x | | |
| Difficulty with zero in the minuend | | | x | | |
| Counting to get remainder | | | x | | |
| Subtraction of same number in subtrahend from two numbers in minuend | | | x | | |
| Counting on fingers | | | | | x |
| **Errors and Difficulties in Multiplication:** | | | | | |
| Errors in combinations | | | x | x | x |
| Difficulty with zeros in multiplier and multiplicand | | | x | x | |
| Difficulty with addition in multiplication | | x | | | |
| Securing multiplication combinations by adding | | | x | | |
| Counting on fingers | | | | | x |
| **Errors and Difficulties in Division:** | | | | | |
| Failing to bring down zero when it would not go | x | | | | |
| Errors in combinations | x | | x | | x |
| Using long division form for short division form, and *vice versa* | x | x | | | |
| Counting on fingers | | | | | x |
| Difficulty in subtracting in division | | | | x | |

8. Under the conditions set up and from the data at hand it is safe to conclude that a greater part of the gain in achievement was due to the individual remedial work.

9. However, there is nothing in this study to indicate how long these difficulties will remain eliminated. The permanence of improvement should be checked at the end of another seven or eight months period.

# REMEDIATION OF COLLEGE FRESHMEN IN PUNCTUATION

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For several years Miami University has been endeavoring to help freshmen who are preparing for teaching to overcome deficiencies in background essentials. This article reports the procedures utilized and the results attained in a remedial project in punctuation. The remedial work was administered on an individual basis. The time devoted to the project varied from three to fifteen hours according to the needs of the students concerned. On the average, the time did not exceed seven hours per student.

During the first week of the school-year 1929-30, the Guiler-Henry *Preliminary Diagnostic Test in Punctuation* was given to 349 freshmen, who were enrolled in the School of Education. This test was selected because of its diagnostic- survey character. By means of the test it was possible both to discover the students who were weak in punctuation and to identify their individual difficulties. The test covers twenty-six uses of punctuation marks, each of which is measured two or more times. Each test item has a value of one point, and the highest possible score is 120 points. The particular uses of punctuation marks included in the test are given in Table II. The scores of the 349 freshmen tested in the preliminary survey are shown in Table I.

TABLE I
SCORES OF 349 COLLEGE FRESHMEN ON THE PRELIMINARY PUNCTUATION TEST

| TEST SCORES | FREQUENCY | GRADE STANDARDS | |
|---|---|---|---|
| | | Educational Level | Median Score |
| 116-119 | 1 | College sophomore | 106 |
| 112-115 | 7 | | |
| 108-111 | 17 | College freshman | 96 |
| 104-107 | 31 | | |
| 100-103 | 49 | Grade 12 | 93 |
| 96- 99 | 48 | Grade 11 | 92 |
| 92- 95 | 48 | Grade 10 | 90 |
| 88- 91 | 37 | Grade 9 | 80 |
| 84- 87 | 36 | Grade 8 | 73 |
| 80- 83 | 28 | Grade 7 | 67 |
| 76- 79 | 12 | | |
| 72- 75 | 13 | | |
| 68 -71 | 11 | | |
| 64- 67 | 5 | | |
| 60- 63 | 3 | | |
| 52- 55 | 3 | | |
| Total | 349 | | |
| Mean Score | 92.2* | Median Score | 94.5 |

*Both measures were derived from ungrouped data.

A study of Table I shows that the college freshmen differed greatly in ability to punctuate. The score of the best student was two times that of the poorest student. This range in scores represents a spread of at least seven grades in achievement. Many of the students reached or exceeded the median standard for college sophomores; on the other hand, a large number of the students manifested outstanding weakness. The standard for high school seniors was not attained by 45.6 per cent of the college freshmen; 13.4 per cent fell below the standard for the ninth grade, which marks the last year of the junior high school; and 2.3 per cent did not punctuate as well as the median pupil in the seventh grade, the beginning year of the junior high school. In order to improve the situation revealed by the preliminary survey, a program of remediation was organized for the weaker students. The remedial work was begun with the 148 freshmen who fell below a score of ninety-two, which is the median score for the eleventh grade. Of this number, thirty-two had withdrawn before the final test was given several weeks later; hence, complete data were available for only 116 students. It is with the latter group, who will be referred to hereafter as "remedial students," that the report from this point on is concerned.

The administration of the remedial program was based on the assumption that improvement in learning will be made in proportion as students can be made aware of their individual shortcomings, and in proportion as teaching and practice can be brought to bear on individual points of difficulty. In keeping with this assumption, each remedial student was encouraged to discover his particular weaknesses by an analysis of his own test paper. Each weak student was further encouraged to keep a record of his difficulties after these had been identified. Individual records of shortcomings resulting from this method of analysis are presented for certain students in Table II.

TABLE II

PUNCTUATION USAGES IN WHICH DIFFICULTY WAS ENCOUNTERED BY ELEVEN REMEDIAL STUDENTS AND ERROR QUOTIENTS FOR 116 REMEDIAL STUDENTS ON PRELIMINARY AND FINAL TEST

| USES OF PUNCTUATION MARKS IN WHICH DIFFICULTY WAS ENCOUNTERED | STUDENT | | | | | | | | | | | Error Quotients | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | Pre-test | Final test |
| 1. Dash or dashes to indicate a sudden break in the thought or construction of a sentence | x | x | x | x | x | x | x | x | x | x | x | .975 | .513 |
| 2. Colon after an expression which serves as a formal introduction to the thought that follows | x | x | x | x | x | x | x | x | x | x | x | .888 | .250 |
| 3. Semicolon between clauses of a compound sentence that are joined by a conjunctive adverb | x | x | x | x | x | x | x | x | x | x | x | .870 | .138 |
| 4. Exclamation mark after an expression of surprise or emotion | x | x | x | x | x | x | x | x | | x | x | .698 | .215 |

TABLE II—(Continued)

| Uses of Punctuation Marks in Which Difficulty was Encountered | Student | | | | | | | | | | | Error Quotients | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | Pre-test | Final test |
| 5. Semicolon between clauses that are not joined by a conjunction | x | x | x | | x | x | x | x | x | x | x | .667 | .047 |
| 6. Apostrophe to denote the plural of letters and figures | x | x | | x | | | x | x | | x | x | .525 | .009 |
| 7. Apostrophe to denote possession | x | | x | x | x | | | | x | x | x | .488 | .026 |
| 8. Comma to set off an added element at the end of a sentence | x | x | x | x | | x | x | x | | x | x | .453 | .038 |
| 9. Apostrophe to denote contraction | x | | x | x | | x | | x | x | x | x | .422 | .034 |
| 10. Comma to set off an introductory element at the beginning of a sentence | | x | x | x | x | x | x | x | x | x | x | .391 | .066 |
| 11. Comma or commas to set off words of direct address | x | x | | x | | x | | | x | x | x | .375 | .060 |
| 12. Comma after a dependent clause when it precedes the main clause | | x | x | | | x | x | | | | x | .374 | .125 |
| 13. Period after an abbreviation | x | x | x | x | x | x | x | x | x | | x | .355 | .005 |
| 14. Colon after the salutation of a letter | | | | x | | | | | | x | x | .336 | .000 |
| 15. Question mark after a question | x | x | x | | x | x | x | x | x | | x | .333 | .040 |
| 16. Comma to separate the clauses of a compound sentence when the clauses are joined by a coordinating conjunction | | x | | x | x | | x | x | | x | x | .306 | .091 |
| 17. Comma to prevent misreading | x | | x | | | | x | x | | x | x | .259 | .052 |
| 18. Commas to set off parenthetical expressions | | | | | x | x | x | x | x | x | x | .254 | .009 |
| 19. Underlining to denote italics for the titles of literary and artistic works when these appear as part of a sentence | x | | x | x | | | | x | | x | x | .228 | .073 |
| 20. Quotation marks to enclose a direct quotation | x | | x | | x | x | x | x | | x | x | .204 | .012 |
| 21. Comma after the complimentary close of a letter | | | | | | x | | | | | x | .147 | .004 |
| 22. Comma to separate a direct quotation from the rest of a sentence if the quotation is not a question or an exclamation | x | | | | | | | | | x | x | .135 | .000 |
| 23. Comma to separate words or groups of words used in a series | | x | | x | x | x | x | x | | | x | .119 | .086 |
| 24. Comma to separate parts of a date | | | | | | | x | | x | | x | .113 | .000 |
| 25. Comma to separate parts of an address | | | | | | | | | | x | | .099 | .007 |
| 26. Period after a simple statement | | x | | | x | x | x | x | | x | x | .055 | .008 |
| Total | 16 | 15 | 15 | 15 | 14 | 17 | 18 | 18 | 12 | 20 | 25 | | |
| Average | | | | | | | | | | | | .269 | .048 |

An analysis of the error data exhibited in Table II shows that learning difficulties in punctuation are individual and specific. This fact is revealed in a number of ways. First, errors were made in only three of the twenty-

six uses of punctuation marks by all of the students represented in the table. Second, the students varied greatly in the number of difficulties encountered. Student 90, for example, experienced difficulty with only twelve usages, while Student 110 encountered difficulty with twenty-five usages. Third, the uses of punctuation marks which caused difficulty for the same number of students did not always involve the same individuals. Thus, while seven students encountered difficulty in each of Items 6 and 7, only four of the same students made errors in both items. Fourth, the students who made the same number of errors did not always make the same errors. Although Students 20 and 30 made fifteen errors each, only ten of the errors were made by both.

A second fact revealed by a study of Table II is that marked variation characterized the extent to which the various uses of punctuation marks had been mastered by the eleven remedial students. Evidence for this statement is found in the error quotient data for the preliminary test. The error quotient in each case was obtained by dividing the number of errors made in a particular usage by the number of chances for making errors in that usage. The fact that the error quotient considers frequency of mistakes with relation to the number of opportunities for making mistakes makes it a much more valid and significant measure of the seriousness of error than does a mere count of errors. The error quotients for the preliminary test show that the error hazards involved in Item I, for example, as compared with the error hazards involved in other items, were approximately of the following ratios: with Item 7, two to one; with Item 15, three to one; with Item 18, four to one; with Item 20, five to one; with Item 25, ten to one; and with Item 26, eighteen to one. The marked differences in the mastery of certain usages involving similar elements constitute a third revelation of the data presented in Table II. This fact is shown by the differences in the error quotients in the following items in the preliminary test: 5 and 16, 14 and 21, and 15 and 26.

The remedial work was organized on an individual and self-administering basis. At this point the records kept by the remedial students of their individual shortcomings proved very helpful. The self-teaching and the individualization of the follow-up work were made possible through the use of *A Student's Workbook in Punctuation*,[1] in which the organization of the exercises is such that the student secures teaching and practice on the items which give him difficulty. The work was well motivated due to the fact that each student was made to realize that mastery was his individual responsibility. Regular class periods were scheduled for the twenty-five weakest members of the remedial group. During the class hour the students were free to ask the teacher for help on any use of punctuation marks which the

[1]Walter S. Guiler and Ralph L. Henry, *A Student's Workbook in Punctuation:* A Plan for Individualizing the Study of Punctuation. Hamilton, Ohio: Hill-Brown Printing Co., 1927.

self-teaching material in the workbook did not make clear. The remaining members of the remedial group did their work outside of class. They were encouraged, however, to come to the office of the director of remedial instruction for help whenever they felt that they needed it. The scoring of the practice exercises was done by the students themselves. Correcting keys were available for this purpose whenever the students had exercises to score.

The amount of improvement resulting from the remediation work was measured by the Guiler-Henry Retest in Punctuation. This test was the equivalent of the preliminary test in content and in difficulty. The passing score for the retest was made several points higher than that for the preliminary test in order to counterbalance the loss in ability which is likely to occur after intensive study and practice have ceased. If a student failed to pass the retest, he was required to work on the unit until he could give satisfactory evidence that mastery has been attained. Table III, together with the last two columns of Table II, records the amount of improvement that was made.

TABLE III

IMPROVEMENT MADE BY 116 REMEDIAL STUDENTS IN PUNCTUATION USAGE

| PRELIMINARY TEST | | FINAL TEST | |
|---|---|---|---|
| Score | Frequency | Score | Frequency |
| 88-91 | 31 | 120 | 1 |
| 84-87 | 33 | 117 | 6 |
| 80-83 | 21 | 116 | 7 |
| 76-79 | 12 | 115 | 13 |
| 72-75 | 7 | 114 | 12 |
| 68-71 | 8 | 113 | 16 |
| 64-67 | 2 | 112 | 21 |
| 60-63 | 1 | 111 | 24 |
| 52-55 | 1 | 110 | 60 |
| | 116 | | 116 |
| Median | 84.9* | | 112.9 |
| Average | 84.4 | | 112.8 |

Average Number of Punctuation Usages in Which Errors Were Made

| | |
|---|---|
| Preliminary test | 15.7 |
| Final test | 4.0 |

*Both measures were derived from ungrouped data.

A study of the data contained in Tables II and III shows that marked improvement in ability to punctuate was made by the 116 remedial students. Evidence for this statement is found in three types of data. (a) The error quotients in the final test were much lower than those in the preliminary

test, the average quotient being reduced from .269 to .048. In all, except five, of the twenty-six uses of punctuation marks listed in Table II the error quotient in the final test was reduced below .1; in nine of the usages the error quotient was reduced below .01; and, in three of the usages it was reduced to .000. (b) The average number of usages in which errors were made was reduced from 15.7 in the preliminary test to 4.0 in the final test. (c) The average student score was increased from 82.4 in the initial test to 112.8 in the final test. Interpreted in terms of the grade standards given in Table I, this gain in scores means that the average achievement of the 116 remedial students was raised from considerably less than tenth grade ability to a standard better than that attained by the average college sophomore. When individual scores are considered, it is found that all of the students receiving remedial instruction attained the standard for their grade in the final test, whereas all were below standard in the preliminary test; in fact, the lowest score made by any of the remedial students in the final test was nineteeen points higher than the best score attained by any of these students in the initial test.

The data which have been presented seem to justify the following statements, which are made by way of summary and conclusion.

1. The 349 college entrants included in this study varied greatly in their mastery of the field of punctuation and in their mastery of specific usages. The score of the best student in the preliminary test was sixty-three points higher than that of the poorest student. This difference in scores represents a spread of at least seven grades in achievement.

2. Many of the college freshmen exhibited marked weakness in ability to punctuate in the preliminary test; over thirteen per cent were below the standard for the ninth grade, and a large number were deficient in many usages which supposedly had been mastered in the elementary school.

3. Comparatively few of the punctuation usages offered difficulty for large numbers of students; only six of the twenty-six usages presented difficulty for as many as one-half of the students.

4. The students manifested marked individuality in the types of errors that were made. This fact seems to indicate a distinct need for individualized remedial instruction.

5. Ability in punctuation is a composite of ability to use a number of punctuation marks in a wide variety of situations. Punctuation is not merely a matter of full stops, stops within the sentence, and special marks. It is also a matter of different kinds of full stops, such as the period, the question mark, and the exclamation point; different kinds of stops within the sentence,

such as the comma, the semicolon, the colon, and the dash; and, different kinds of special marks, such as the apostrophe and quotation marks. Nor is this all, for a mark may serve one function in one situation and quite a different purpose in another. The comma, for example, serves one function in separating words used in a series and quite a different use in separating the parts of an address. This composite nature of punctuation ability should lead teachers to expect that learning difficulties in this field would be individual and specific.

6. Marked improvement in ability to punctuate may be expected when a remedial program first discovers the usages which are difficult for the group and for individuals and then provides self-teaching and practice materials of types definitely suited to individual needs.

# A PROJECT IN THE PROFESSIONALIZATION OF SUBJECT MATTER THROUGH THE STUDY OF THE HALOGENS

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There is a legend that there existed at one time in the long, long ago, a medical school which possessed neither laboratories nor clinical facilities. The only instrument in that institution which resembled the surgeon's knife was the keen sarcasm of the medical professors who gorged their embryonic "medics" with hypothetical case studies and exacted of them regurgitations of these hyper-theoretical lectures, all in a most boring manner. Of course this institution existed in the days before cadaverous experimentation became legal.

It has been said that there exists today a type of school which is very similar to this old medical school—the teachers' college. The similarity between our present-day professional school for the training of teachers and the antiquated medical school lies in the lack of adequate laboratory practice in both.

Is the teachers college as much without method as the legendary medical school was without clinical facilities? Are the practices and methods of teaching as important to the teacher as clinical studies are to the doctor? What values would be derived from adding to a regular subject matter course a weekly period of practice teaching? The study herein developed will attempt to answer these questions.

In order to obtain definite information upon this matter, an attempt was made, in the spring of 1930, to plan and adapt a unit of college chemistry for children in the ninth grade. The subject was presented by the chemistry students, to pupils of the training school. The object was to discover whether students derive any practical advantages for teaching from a subject matter course.

The class in second-semester general college chemistry was selected for the experiment. The members of this class were allowed to choose a unit of chemistry subject matter, organize, and present it. The study was made under the supervision of the college instruction in chemistry and the critic teacher of the college's educational laboratory. The experiment attempted not only to co-ordinate the activities of the training school and the professional

school, but also to interest the students of the teachers' college in the profession.

The unit of subject matter chosen for the experiment was a study of the members of the halogen family (Fluorine, Chlorine, Bromine, and Iodine), their use and relative importance. The unit was studied in the regular manner of college classes until it was thought the members of the class had mastered the subject sufficiently well to enable them to answer any questions which might be asked by the members of a training school general science class.

The members of the class elected one of the group as instructor and also selected three assistant instructors. Then, with the study of the halogens still fresh in their minds, they proceeded to change the information they had acquired on this subject from the mental level of the college student to that within the range and interest of a ninth grade class in beginning science.

All the members of the content course in college chemistry participated in the experiment, certain ones being assigned definite duties. Some were assigned to the changing of the material to the mental level of the ninth grade pupils; some to the selection and arrangement of such laboratory experiments as could be presented during the lecture demonstration and within the reach of the ninth grade children; others were given the task of selecting and studying references which developed the educational practices along such lines as those in which they were interested; and still others had the task of finding and studying references on the applications of tests and measurements to such a unit of subject matter.

After the unit of subject matter had been adapted to children of the ninth grade, it was presented in this simplified form to the class in general science in the training school. The critic teacher of the educational laboratory co-operated and assignments in the general science class were made in this particular unit of subject matter before the college students took over the presentation of the material.

The student teacher selected by the class, together with her assistants, met at an appointed time with the critic teacher of the training school and worked out a lesson plan or teaching cycle for the experiment. They also wrote out a glossary of the technical terms which would necessarily be used in the presentation of the material, so that the children of the general science class would have sufficient opportunity to study these terms before coming to the lecture.

After due preparation had been made, both on the part of the student teachers and the general science class, they met in a regular session in the demonstration room of the educational laboratory together with the entire chemistry class, the director of the training school, the critic teacher of the grade, and the college chemistry teacher as an observer.

The student teacher began the class discussion with a few exploratory questions, attempting to develop the uses and applications of the four elements, Fluorine, Chlorine, Bromine, and Iodine, and their compounds. Two other students of the chemistry class assisted in performing several simple lecture demonstrations, following each demonstration with a complete discussion.

The first experiment was one in which a piece of glass was etched by means of a compound of fluorine, hydrofluoric acid. A glass plate was coated with paraffin, and the name of one of the students was scratched through the paraffin with a pin point. The plate was then placed with the name down over a lead dish containing sulfuric acid and calcium fluoride, a compound of fluorine. The name was etched clearly on the glass, and the training school children received the results of the experiment with enthusiasm.

An ink spot was removed from a handkerchief to illustrate the bleaching power of chlorine. The children appreciated the experiment immensely, as the ink spots and their removal are everyday problems. The next experiment performed was the preparation of tincture of iodine from ethyl alcohol and pure iodine crystals. The children were all familiar with tincture of iodine and believed this to be the original form of iodine. Thus, this experiment was of especial value to them.

The assistant instructors then proceeded to tell the story of the life and work of the four halogens by stating the date of their discovery, the names of their discoverers, and by pointing out the relationships, one to the other, of the elements as regards their chemical and physical properties. They explained the origin and derivation of halogen names and with emphasis pointed out the various uses of the halogens themselves and their compounds.

After the thirty-minute teaching cycle, consisting of exploratory questions, lecture, demonstrations, and a talk on the uses and value of halogens, the student teacher with her assistants gave a short test to the pupils of the general science class. This test, based upon the uses and applications of the four elements of the halogen family, consisted of questions of completion and multiple choice type. At the end of ten minutes the papers were turned over to the college chemistry class to grade and score.

The children were dismissed from the room, and a discussion was then started by the college class, the director of the training school, and the critic teacher. The critic teacher made several suggestions as to the presentation and informed the student teacher and assistants that the study of the halogens had been presented in a most helpful and interesting manner.

The following statistical measurements obtained from the results of the test bear significant evidence of mastering the subject matter on the part of the general science class: Mode, 19; Median, 18.5; Mean, 18.4; Sigma

scores, 1.2; Sigma IQ, .48; Mean of Score, 18.4; Mean of IQ, 111.4; R, .48. From these results one can see that a rather high mean score was made by the group; that it was a normal group of scores, and that there was a rather significant correlation between intelligence quotient and achievement quotient.

On the part of the chemistry class, the entire project, including the learning of the subject matter, the organization of the subject matter, the reduction of the subject matter to the level of the general science class, and the presentation and securing of results—consumed about three lecture periods and two double laboratory periods, or approximately the same time which is consumed by the average college chemistry class in the study of the halogen family.

A bibliography of the references used by both classes during the extent of the experiment follows:

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3. Holmes, Harry N., *General Chemistry*, The Macmillan Company, New York City, 1930.
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5. Newall, Lyman C., *General Chemistry*, D. C. Heath and Company, New York City, 1922.

B. Current Educational Practices Showing Co-operation between Academic Subject Matter Courses and Training Schools.
1. Chittenden, Merritt D., "The Oswego Normal and Training School Plan." *Educational Administration and Supervision*, 1925.
2. Edwards, R. A., *A Manual for Observation and Method*, Eastern State Teachers College, Richmond, Kentucky, 1928.
3. Frank, J. O., "Aspects of Practice Teaching in the Preparation of Chemistry Teachers in a State Normal School," *Educational Administration and Supervision*, 1925.
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C. Psychology of the Subject matter.
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# THE LOCATION AND DEVELOPMENT OF ACCREDITABLE LIBRARY TRAINING AGENCIES IN THE SOUTH

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In his stimulating and amusing study, *Universities, American, English, German,* Mr. Abraham Flexner tells us that the pursuit of science and scholarship belongs to the university, but not secondary, technical, vocational nor popular education. "Of course, these are important, of course society must create appropriate agencies to deal with then; but they must not be permitted to distract the university."

In August, 1926, thirteen months after the adoption of minimum standards for library schools by the Council of the American Library Association, fourteen accredited schools were listed, in the second annual report of the Board of Education for Librarianship. Only five library schools were maintained at universities in 1926, and one of these used quarters in the local public library. Three of the fourteen accredited schools were maintained at technological institutes, four in public libraries, one in a state library and one at a girls' college.

From Mr. Flexner's point of view the situation has assuredly grown worse, for in the 1930-31 annual report of the Board of Education for Librarianship of the American Library Association we find the 1925 list of fourteen schools swollen to twenty-five, accredited and provisionally accredited library training agencies, with fourteen new names, including no less then seven additional universities. Somewhat more in line with Mr. Flexner's point of view, it might be mentioned that while the original list of library schools included no colleges for teachers, three of these institutions now maintain standard schools, and two state colleges for women have also entered the library training field with full approval of the accrediting agency of the American Library Association.

Mr. Flexner feels that university librarianship is not necessarily a fit subject for university training, and cleverly quotes from a report of President Keppel of the Carnegie Corporation to the effect that: "Pratt Institute, it may be pointed out, offers no degree at all, and still maintains its place as one of the best schools for the professional study of librarianship." And again: "The way should be made easy for able men with scholarly tastes and training in letters to shift from the over-crowded field of English teaching (or I should add, any other) to librarianship." These comments, as Mr. Flexner em-

phasizes, are cited from the president of a foundation which has appropriated no less than $1,410,000 to a Graduate Library School at the University of Chicago!

While the chief impetus to the development of library training in the South unquestionably has come from the new high school library standards of the Association of Colleges and Secondary Schools of the Southern States, nevertheless it is interesting to note that in the brief interval between the setting up of the new high school library standards (in December, 1927) and the endowment of the first of three Southern school library training agencies (in May, 1930), the only library school in the South listed among the original fourteen moved from the public library in Atlanta to Emory University, and the Carnegie Corporation made a grant to the University of North Carolina for a library school wherein "emphasis may be placed on the preparation of librarianship for universities and colleges. With research and bibliography well in the foreground. . . "

Blessed with neither the time nor the money to evolve Utopian theories regarding university organization, librarians have proceeded on the assumption that numerous universities will offer library training adequately, and librarians have even not hesitated to transfer schools hitherto specializing in public library service to university settings, in the cases of Atlanta and New York City.

In December, 1929, the Policy Committee of the Southeastern Library Association, anticipating a scheduled joint-meeting of three educational foundations, requested a survey of the library school situation in the South by the secretary of the Board of Education for Librarianship. This survey was ultimately financed by the Carnegie Corporation and resulted in an exceptional supervision by the national accrediting agency of library training developments in southern states. A preliminary word is needed to describe the "need of controlling the spread of mushroom schools," as expressed by the Policy Committee of the Southeastern Library Association in December, 1929.

The high school library standards of the "Southern Association" were adopted in December, 1927, and originally were planned to become fully operative in September, 1930, but time has now been extended to the fall of 1933. The standards call for part-time trained librarians in the smaller four year high schools and for full-time, one-year trained librarians in all schools with enrollments of over two hundred students. Over eleven hundred high schools are "approved" annually by the Southern Association, and courses in library science to meet the new demand were promptly embarked upon by numerous agencies, so numerous by the summer of 1930, when the survey requested by the Southeastern Library Association was undertaken, that no less than twenty-nine Southern institutions were offering courses in

library science. These institutions included, within the section of the Southern Association, eleven state universities, four state teachers colleges, four state colleges for women, three state polytechnic institutes, and seven private colleges or universities of various character.

No less than eighteen of the curricula were scheduled for the regular academic year as well as for the summer. Details as to organization and administration, professional preparation of the teaching staff, equipment, financial status, requirements for admission and courses were, in a number of instances, given far less consideration than they deserved.

The standards of the Board of Education for Librarianship required, for a library school of fifty students offering a year's course, a teaching staff of no less than four. Minimum standards for curricula in school library training contemplated courses of one-half or one year's duration with one or more full-time teachers. A year or half year's school library work might be offered in successive summers and general courses might also be offered, but only in case summer faculties included at least four teachers.

Reasonable as were these standards, they nevertheless appeared too severe to many college and university administrators in the South between 1927 and 1930. At length the Southern Association adopted its own school library training standards at its regular annual conference in December, 1930.

The standards of the American Library Association had been developed from conditions found in the first fourteen library schools, accredited in 1926. By that time librarianship had apparently achieved sufficient professional dignity to justify at least four different teachers for the presentation of courses, even for a curriculum of but a single year's duration. In October, 1916, minimum standards for curricula in school library work were adopted by the Council of the American Library Association. These standards were planned for a less complex type of library work, as evidenced by the limited number of the instructional staff. The full time of only one teacher was required for an enrollment of approximately twenty-five students, although for a larger enrollment the number was required to be increased proportionately.

As matters have developed, the new library training standards of the Southern Association give admirable support to the American Library Association standards for the full year's work. "There must be at least two teachers, devoting full time to instruction in library science in a school offering 24-30 semester hours," says the Southern Association. And even in a school offering no more than six hours, the teacher must be a college graduate and a graduate of an *accredited* library school!

We have in these new standards proof of trustful co-operation between the library committee of the Southern Association and the Board of Education for Librarianship. The danger that limited curricula may be expanded into

one year schools with inadequate teaching staffs has been definitely averted. We now look forward with interest to the first report of an official inspection of the library training agencies of the Southern Association.

In the survey of library schools undertaken on the recommendation of the Southeastern Library Association's Policy Committee, it is stated that, "Certain places stand out as good locations for certain types of development." Looking into the future it is suggested that, "With the combination at Birmingham of a well developed library environment in the Birmingham Public Library, with its county work, the growing school libraries under the Board of Education, and a library-minded institution such as Birmingham-Southern College, there would seem to be no question but that a library school offering a high grade of work should be developed when sufficient demand for trained librarians is proven." And we are also told that, "At Baltimore . . . Johns Hopkins University through its College of Education will probably come into the Southern plan through the establishment of a library school." All this is looking ahead. What sort of a picture presents itself at the moment?

The fall of 1931 finds the South with a program of accreditable library training well launched. The veteran accredited school formerly located in the Carnegie Library of Atlanta begins its second year in its new setting at Emory University. Several men students are assured, due to special scholarships offered by the Julius Rosenwald Fund. The North Carolina College for Women at Greensboro has recently achieved full accreditation from the Board of Education for Librarianship as a junior undergraduate library school for the training of school librarians; and the University of Tennessee has likewise been fully accredited as a sixteen semester hour curriculum offering school library training. George Peabody College for Teachers, with its work already provisionally accredited, enters upon the second year of its expanded courses in library science under a three year grant from the General Education Board. This assures four teachers in winter and seven in summer, offering both first and second year training, going beyond mere instruction in school librarianship into the field of research.

The University of North Carolina, having been able to announce its special appropriation from the Carnegie Corporation as early as the fall of 1929, at length inagurates its new general library school curriculum, which will be accreditable in a minimum length of time, of course. A grant from the General Education Board announced during the summer of 1931 has assured the development of an accreditable library school at Louisiana State University, where a cumulative curriculum operated on a successive summer basis has hitherto been conducted; and another grant from the same foundation provides for adequate school library training at the College of William and Mary, in Virginia.

These are the southern library training agencies organized on a standard basis. Let us hope that the other agencies will strive for similar standards, or cease to offer library instruction. Too many schools will flood the market, of course.

# TEACHING SOCIOLOGY AT SARAH LAWRENCE COLLEGE

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It is the purpose of this article to present the results of a two years experiment in teaching Sociology in a college where standard types of curriculum and methods of teaching have been for the time being set aside. It should be understood that this represents the efforts of a single member of the faculty working each year with two groups of students. It is without doubt one of a number of separate experiments simultaneously conducted which as yet have received only student criticism largely because of the highly individualized set up of the faculty and the general absence thus far of any method of scientific review or evaluation.

The results of this particular experiment seem to demonstrate the possibilities of achieving keener critical analysis, greater facility in oral and written reports, more in quantity and quality and greater individual freedom than have been achieved through any of the more conservative methods of teaching previously used. It is believed that the value of this method is not restricted to small classes in an experimental college, but may be adapted easily and successfully to larger groups of students in senior high school or regular college courses.

The immediate purpose of these courses in Sociology is neither to prepare students for the two upper years of a four-year college nor to equip them especially for organized social work. The students come in large part from highly privileged homes in which the intelligent use of leisure and broad social values form immediate and imperative needs. The college is interested in highly socialized leadership and the content of these courses has been arranged to nurture this objective.

The students compare in general to those in the freshman and sophomore years of standard four-year colleges. The majority are eighteen and nineteen years of age although some exceptions are to be found both below and above these levels. In preparation they would average somewhat below the standards required for entrance in four-year colleges. Many have already developed spheres of interest which exclude in some cases mathematics, science, Latin or other courses definitely required for College Board Examinations. Some have definite interest and ability in some one of the Fine Arts. Their social advantages have in many cases given them rare opportunities for travel and

the extensive geographical area represented in any of the groups in Sociology brings to it a richness of culture difference which is invaluable.

An evaluation of any experiment requires a clear understanding of the conditions under which it is conducted and the conditions of this experiment have been determined in large measure by the general plan of the college. This plan is carefully described in the third catalogue of the college prepared for the college year 1930-1931. "The college selects from among the applicants for admission those who give promise of being ready to profit most from such a plan of education." There are approximately two hundred resident students and a limited number of day students.

Under the original plan the classes were to be small. Thirty-five students were designated to constitute a full faculty load and these would probably be divided for teaching purposes into two groups. The emphasis was to be placed upon individual interest and individual instruction. In the organization of courses there were no sequences or prerequisites and no attempt has been made to prepare students for transfer. During the first year there were two groups studying General Sociology and during the second year there have been two groups, one in General Sociology and the other in special Social Projects. The Social Projects group was made up entirely of seniors each of whom carried on an individual project. Membership in this group required previous work in Psychology, History, Economics or Sociology.

The composition of these several groups according to the scores of the individual members on the Thorndike Intelligence Tests for High School Graduates which was given, as a part of the entrance requirements to the college is of particular and possibly general interest. During 1929-30 the two divisions in General Sociology had a total membership of 29 students: 20 seniors and 9 freshmen. The average Thorndike score for these 29 students was 61-plus. The average score for the 20 seniors and for the 9 freshmen taken in separate groups was also 61-plus. For actual class grouping the seniors and freshmen were mixed in such a way that one division contained 17 students, of whom 12 were seniors and 9 freshmen. The average score of this division was 59-plus with the 12 seniors holding an average score of 58 and the 9 freshmen 61-plus. During 1930-31 the total number of students studying Sociology was 23 of whom 16 were seniors and 7 freshmen. The average Thorndike score for these 23 students was 58-plus. These 23 were so divided that 8 were seniors in the Social Projects group with an average Thorndike score of 63-plus and the remaining 15, 8 seniors and 7 freshmen, were in General Sociology. These 15 had an average score of 55-plus. The extreme scores for 1929-30 were 36 and 81: while the extreme scores for 1930-31 were 27 and 81.

CHART SHOWING DISTRIBUTION OF TWO YEARS GROUPS ACCORDING TO RECORDS OF THORNDIKE INTELLIGENCE TESTS FOR HIGH SCHOOL GRADUATES

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | (69)* | | |
| | | | | (69) | | |
| | | | | (68) | | |
| | | | | (67) | | |
| | | | | (67) | | |
| | | | | (67) | | |
| | | | | (67) | | |
| | | | 57 | (66) 67 | | |
| | | | 56 | (65) 65 | | |
| | | (48) | 55 | (62) 65 | | |
| | | (48) | (55) 55 | (60) 62 | 74 | |
| | | (45) | (55) 53 | (60) 62 | (79) 71 | |
| | 39 | (45) | (54) 52 | (60) 62 | (75) 70 | (81) |
| 27 | (36) 38 | (42) 48 | (54) 51 | (60) 61 | (75) 70 | (80) 81 |
| 20% | 30% | 40% | 50% | 60% | 70% | 80% |

*1929-30—29 students: 20 seniors; 9 freshmen; average 61 plus. 1930-31—23 students: 16 seniors; 7 freshmen; average 58 plus. Grades enclosed in ( )

The conditions under which the work in Sociology has been carried forward have remained nearly constant. The two-hour weekly group meetings have been held for both groups between eight-thirty and ten-thirty in the morning while the individual conferences as far as it has been possible have been scheduled for the morning hours. There has been some modification of the conference program to suit special student needs and for purposes of experimentation and evaluation of method. In general the individual conferences are scheduled for one-half hour each week. In practice many students have wished longer conferences and often two students came together for one hour. In some instances where students have been slow readers or have found it difficult to clarify their material an hour conference has been arranged for a limited period and careful attention has been given to methods of study. All members of the senior group in Social Projects have had individual one hour conferences to make it possible for them to give an adequate report of the material prepared and to build up a definite plan of work for the coming week. The only major change has been in the arrangement of library facilities. The college started with departmental libraries, although no actual departmental organization existed. Under these circumstances group conferences were held in the room with the entire reference library in Economics and Sociology at hand. This was ideal for class purposes and with the addition of the main library the loss of this facility has been definitely felt. At all other hours the central library offers the greater advantage since the success of the work depends so largely on the wise and extensive use of constantly available source materials. The present shelf list in these two subjects includes approximately 675 titles.

The syllabus for General Sociology was prepared as a tentative core for a one-year general course which would give to students largely of the leisure

class and in many instances of the leadership class a general knowledge of the types of social problems which have constantly confronted mankind together with an understanding of some of the best methods which have been proposed for their solution. The first syllabus, which was prepared with no knowledge of the nature of the student body or of the possible correlation of courses, was considerably modified in practice as the college year progressed and at the end of the first year it was definitely modified in form. It is now ready for still further modification if it is to represent the refining influences of the second year. The syllabus for the course in General Sociology was prepared each year in advance and given to the students during the first meeting of the class. In Social Projects only a brief descriptive plan was worked out and the syllabi are being prepared as the individual projects are developed.

The syllabus in General Sociology divides the work of the year into four parts of widely varying length. Part I includes approximately six weeks of work and serves as an orientation and foundation for the individual work which follows. Most of the students have little idea of the real nature of Sociology or of its place in the general development of the sciences. Questions are raised around these problems and extensive reading is done. During the first six weeks the work is done as a group on the same subject matter. An attempt is made to give meaning to such questions as these:

1. The place of Sociology in the evolution of the sciences.

2. The interrelation between Sociology and the other Social Sciences such as Economics, Political Science, Religion, History and Psychology. The student's knowledge in related subjects is drawn upon.

3. How Sociology and Social Work are related. Have they common or separate spheres? Two weeks are spent on intensive reading on the development of Social Thought and the simultaneous development of Social Work. An attempt is made to revitalize their knowledge of history, literature, and economics.

4. The *age of man* and the probable beginnings of our present social institutions.

5. The influence of geographic, economic and psychic factors upon the distribution and development of man.

6. The importance of sociological factors in stabilization of social affairs.

With this as a general base Part II is approached.

Part II has been organized to meet the individual interests of the students as they have developed out of the work in Part I. At Thanksgiving time a large collection of reference books are placed on the reserve shelves. These are selected in relation to the four special fields of Sociology from which each student selects according to his personal interests. The four choices are: The Family, Immigration, Social Origins, and Social Problems. Before leaving for Christmas vacation each student after reading extensively

in the reserve list makes her selection and orders the textbook required. Approximately four and a half months, from Christmas recess to May 1, are set aside for the completion of Part II. At the beginning of the work each student reviews the main topics to be covered, divides her material into time units, works out a set of cross references and with the other members in her field constitutes a new interest group. During this part of the year the main group consists of four separate interest groups which have a degree of organization and report every two weeks at the general group meetings. The broadening influence of this four sided presentation of sociological material cannot be overestimated.

The month of April is set aside for the study of a special family group. Students are interested to relate specific cultures to specific types of adjustment problems. The students of Immigration may very properly study the Germans, Italians or Irish; the Social Origin group the Eskimo, the Australian Blacks or the people of New Guinea thus leaving a very wide selection for those studying Social Problems or The Family. The library facilities have been greatly strengthened around seven groups—the Chinese, Jews, Scandinavians, Irish, Italians, Negroes, and Americans. Not only factual texts but many biographies and historical novels are available. In every case where it is pertinent these people are studied in their native culture and again as an adjusted group in this country.

When the syllabus is presented at the opening of college a supplementary outline of a community survey is given to each student. During the year through correspondence or personal visits each student gathers information regarding their home community until adequate material is gathered covering each item on the prepared outline. Many enlarge upon the tentative outline while others cover the main parts rather generally and give special emphasis to some particular local interest. The month of May is set aside for the final preparation of this survey of their home community. This constitutes Part III of the syllabus and has proven one of the most illuminating and gratifying aspects of the work.

Part IV covers a period of two weeks set aside for summary and general review. A group project, which is continuous throughout the year, is the development of a reference file made up of ephemeral source material from newspapers, magazines, and printed reports. Much of this material is collected in connection with the community surveys. The reclassification of this material for the permanent reference collection of the library is done early in June and much valuable material descriptive of the community organization of many of the cities of the United States is included.

Examinations as such have played a very small part in these courses and in 1930-31 instead of any final examination each student prepared a detailed syllabus of the course as she worked it out. These were typed and bound

together as a symposium of the individual character of the course. Originally the college was to function with the advice and help of a Board of Examiners. For two years there was such a Board and last year a large number of the students in General Sociology elected to take these "Outside Examinations." In practice this examination was prepared by the instructor and approved by the examiner. It was anticipated that the examiner would prepare the examination after he had become more familiar with the subject matter covered. These examinations were evaluated by the outside examiner and the standard of the results was very high. The discontinuance of the Board of Examiners makes it impossible to present a copy of the outside examination for this year. This is regrettable as it offered many opportunities for improvement.

In the original plan of the college other means were proposed for the evaluation of a student's individual growth in a given subject. There were to be ten goals or special projects spread over the year's work at fairly equal intervals. The nature of these goals would vary greatly with courses. There were to be fixed dates when each goal was due but they might be completed at any previous time and a new goal started. In this way each student would determine his own speed of work.

In Sociology there have been seven goals. There were also to be contracts or special goals which would represent work over and above the general requirements of the course. These were to be of two types: Alpha and Beta. In 1929-30 many students took out contracts and completed them but the general confusion which arose among the faculty regarding their value and classification has tended to eliminate them from the college program. In general, contracts were not suggested in 1930-31 and the quality of the regular work seems to have been strengthened.

Considerable thought has been given to the improvement of group and individual conferences. In principle the instructor takes full responsibility for the organization of the two-hour conference and places the entire responsibility for the individual conference upon the student. The two-hour group meeting is divided into two parts: the first hour is given over to all matters of group discussion, topic reports, current events or written review and the second hour very generally to lecture purposes in connection with advanced work. Each student comes to her conference with a card upon which she has prepared a report of her work for the week. This includes a list of her readings in books and magazines, suggested topics which she is prepared to discuss and questions which she wishes to raise. These conference cards are filed each week and form a complete record of the student's individual work. They have done much to clarify and strengthen this very important element in the experimental set-up.

Field trips are a regular part of the educational program of the college. In many courses they are invaluable and while they have been used with interest and advantage in a limited way it has been the policy to discourage observation of problem situations until the students had sufficient information for scientific evaluation. As an alternative, each year a Sociology Club has been organized in which the membership was open. Approximately forty-five students have used it regularly as a leisure time interest. The Club has held its meetings bi-monthly at tea time. Each meeting has been led by a person of recognized ability in some phase of organized social activity and generally the talks have opened the way to lively student discussion. It has been the purpose of the club to develop an open forum for the presentation and discussion of vital social problems. During the two years excellent speakers have been secured without cost and the voluntary attendance of from 25 to 65 students has justified its continuance.

This experiment has carried with it a heavy toll in hours consumed. The instructor has had a regular program of at least 24 scheduled hours spent in actual face to face contacts with individuals or groups. All preparation of new material, corrections, professional contacts and scholarly endeavor fell entirely outside. Physically it has taken all and left little time or strength for new growth. Mentally it has challenged every field of training or experience and has revitalized a considerable unusued material. The results however have been most gratifying. The group during both years has covered a much more extensive and intensive program than could possibly be attempted in a regular college with larger classes and the lecture system. The returns to the individual could be fairly summarized under the following six headings:

1. An appreciation of the broad implications of Sociology as a philosophy of daily living.
2. A keen sense of the scientific aspects of community life and social progress.
3. Training in oral composition as a recognized tool in the creation of public opinion.
4. Steady improvement in the vocabulary and techniques necessary to written reports.
5. Facility in the use and organization of source material.
6. A new sense of personal responsibility and social generosity.

The real value of any experiment is, it seems, to discover a method particularly suited to the immediate situation but highly adaptable to the

field at large. Every completed experiment seeks a new field to grow in and the experimenter finds for herself a new problem. What, then, are the ways in which this very gratifying and interesting method of instruction might be adapted to the large classes of senior high schools and colleges? There is real need of greater individual development, richer intellectual experience and closer personal contacts. All of these needs seem to be well within the reach of such a method of instruction. The two-hour group conferences could be so arranged as to include two or three students working on similar projects. It would be possible to increase the membership three times and still gain many of the most valuable results. Such an experiment offers a very real challenge to the teacher who cares and its possible adoption in our senior high school and junior college years would bring to these students a resourcefulness not generally achieved. It is in these wider fields of service that the experiments of Sarah Lawrence College should register their greatest contributions and the vision of its founder should attain its ultimate fulfillment.

# PROBLEM SOLVING IN ARITHMETIC

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The solution of problems without the use of pencil and paper has always been an integral part of instruction in arithmetic. The mental solution is generally conceded to be the fundamental part of the work. The use of paper and pencil aids the student only in keeping account of the numbers while he does the mental work involved. Some time ago, the writer made a study of the ability of children to solve arithmetic problems when the problems are read by the teacher and solved by the children without the use of paper and pencil except in setting down the answers.[1] The problems in the original study were later arranged in a scale[2] for testing ability to solve problems somewhat as the different spelling scales are used to test spelling ability.

This paper reports the results of an investigation which compares the ability of children to solve a series of problems read aloud by the teacher with their ability to solve problems of equal difficulty, but read by the children. In each case the children used paper and pencil only in the recording of the answers. The study also shows the relationship between ability to solve problems presented in each of the two ways mentioned and ability to solve problems read by the student when paper and pencil are used as frequently as he desires to do so. The investigation is centered around the following questions:

1. How do the grades differ in ability to solve problems of equal difficulty when the problems are read aloud by the teacher and solved without the use of pencil and paper?
2. How do the grades differ in ability to solve problems of equal difficulty when the problems are read by the student and solved without the use of paper and pencil?
3. Do the grades differ in ability to solve problems when the pupils read the problems and when the problems are read by the teacher?
4. To what extent do the grades overlap in ability to solve problems presented in the two ways mentioned?
5. What relationship exists between the scores made by pupils on the two types of tests?

[1] M. S. Robertson, Oral Problems Solving in the Elementary Grades, Peabody College Contribution to Education Number Twenty.
[2] Unpublished manuscript.

a. What are the correlation coefficients?
b. What is the advantage of predicting scores on one type of test from scores on the other?

6. What is the relationship between scores on each type of test and scores on a reasoning test presented in written form and solved with the use of pencil and paper when these instruments are needed?

*Tests Used.* The first forty problems in test 8 of the Oral Problem Scale were selected for use. These problems are approximately equal in difficulty for sixth-grade children when read aloud by the teacher and solved mentally. The odd-numbered problems were used for the test read by the teacher and the even-numbered problems were used for the test when the children read the exercises. This arrangement gave as nearly equal difficulty in the problems of the two tests as could be secured. The third test was the Otis Arithmetic Reasoning Test, Form B. The following exercises illustrate the kinds of problems used in the first two tests:

PROBLEMS FROM TEST READ ALOUD BY THE TEACHER

1. If a freight train goes a mile in three minutes, how far will it go in thirty minutes?
3. If Mrs. Kane buys one and one-half quarts of milk each day, how many pints does she get?
5. At four cents a pound, how much do fifty pounds of peas cost?

PROBLEMS FROM TEST READ BY STUDENTS

2. Maud spent 84 cents for 7 yards of ribbon, how much did she pay a yard for the cloth?
4. Find the cost of 1½ dozen eggs at 66 cents a dozen?
6. Find the cost of 2½ pounds of tea at 40 cents a pound?

*Administration of the Tests.* The tests were given by the writer and Miss Helene Sliffe during one week near the close of the school session. Each group was given one test. The children were then allowed to rest a few minutes before the other test was administered. The answers were written on mimeographed forms. The two tests were carefully timed so that exactly ten minutes were allowed on each. The Otis Arithmetic Reasoning Test had been previously administered by the supervisor of elementary schools in the city.[3]

*Statistical Data and Interpretations.* The scores of the six elementary schools of the city were arranged in frequency distributions and numbered from 1 to 6. A frequency distribution was then arranged for all schools

[3]Results made available by W. H. Hatcher and C. B. Turner, of the Baton Rouge Public Schools, Baton Rouge, Louisiana.

combined. The scores for seventh-grade children were taken from the six divisions of the seventh grade which is the first year of work in the Baton Rouge Junior High School. The mean scores for the different groups and for all groups combined are shown in Table I.

TABLE I

MEAN GRADE SCORES

(The scores are reported in percentages since the norms are expressed in this way)

| SCHOOL OR GROUP | GRADE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | FOUR | | FIVE | | SIX | | SEVEN | |
| | Read by Teacher | Read by Pupil | Read by Teacher | Read by Pupil | Read by Teacher | Read by Pupil | Read by Teacher | Read by Pupil |
| 1 | 36.8 | 39.6 | 45.6 | 60.9 | 70.7 | 86.1 | 59.8 | 87.0 |
| 2 | 25.2 | 36.2 | 40.4 | 61.7 | 56.0 | 73.0 | 71.0 | 81.7 |
| 3 | 33.9 | 51.6 | 49.0 | 70.3 | 65.4 | 89.5 | 80.9 | 89.8 |
| 4 | 43.3 | 55.3 | 52.9 | 72.2 | 73.0 | 83.6 | 66.9 | 88.1 |
| 5 | 39.0 | 42.5 | 43.3 | 51.2 | 62.7 | 84.7 | 60.0 | 83.3 |
| 6 | 31.5 | 37.0 | 40.6 | 70.1 | 66.0 | 80.1 | 72.1 | 87.3 |
| All | 36.0 | 45.8 | 46.0 | 66.2 | 66.0 | 83.7 | 70.1 | 86.3 |
| Norm | 31.7 | None | 50.8 | None | 65.5 | None | 78.5 | None |

Table I shows a consistent gain in each grade over the preceding grade when all pupils tested are grouped together. This is true of both tests. There is a wide variation of averages in the several different schools. In every group, however, the mean score on the test read by the pupils is higher than the mean score on the test read by the teacher. This indicates that children solve problems more successfully when they are allowed to read them.

In Table II, the grade differences are shown in point scores, that is, in the number of problems correctly solved. This table also shows the reliability of the grade differences and the percentage of overlapping of the grades. When the problems are read by the teacher, the difference is greatest between the fifth and sixth grades and least between the sixth and seventh grades. When the problems are read by the pupils, the difference is greatest between the fourth and fifth grades and least between the seventh and eighth grades. In every case, except two, the differences are sufficiently large to indicate reliability. In the two cases referred to, the differences are fairly

reliable. The least reliable one is between the sixth and seventh grade averages for the test in which the pupils read the problems. Here the difference is .41 ± .22. This indicates that in similar groups the chances are 90 in 100 that seventh grade students will make a higher mean score than will be made by sixth grade students. When the teacher reads the problems, the difference between the sixth and seventh grade averages is .79 ± .29. This indicates that in similar groups the chances that the seventh grade mean will exceed the sixth grade mean are about 95 in 100.

TABLE II

GRADE DIFFERENCES AND OVERLAPPINGS

| GRADES | TEST READ BY TEACHER | | | | TEST READ BY PUPIL | | | |
|---|---|---|---|---|---|---|---|---|
| | IV | V | VI | VII | IV | V | VI | VII |
| Difference between grade average and the average of the preceding grade | | 1.81 ± .26 | 4.20 ± .27 | .79 ± .29 | | 4.15 ± .32 | 3.50 ± .25 | .41 ± .22 |
| Percentage of grade that excels the mean of next higher grade | 31.84 | 14.79 | 41.98 | | 20.92 | 20.05 | 45.04 | |
| Percentage of grade that excels the mean of next lower grade | | 66.95 | 85.97 | 58.46 | | 84.00 | 85.72 | 55.90 |
| Percentage of grade that falls below mean of next lower grade | | 33.05 | 14.03 | 41.54 | | 16.00 | 14.28 | 44.10 |
| Percentage of grade that falls below mean of next higher grade | 68.16 | 85.21 | 58.02 | | 79.08 | 79.95 | 54.96 | |

Table II also shows the overlapping of the grades. The overlappings vary from grade to grade. When the problems are read by the teacher, the smallest percentage of any excelling the mean of the next higher grade is 14.79 in the case of the fifth grade. The largest percentage of a grade excelling the mean of the next higher grade is 41.98 in the case of the sixth grade. When the problems are read by the pupils, the smallest percentage of any grade that excels the mean of the next higher grade is 20.05 in the case of the fifth grade. The greatest percentage is again found in the sixth grade in which 45.04 per cent of the pupils excel the seventh grade mean.

Comparing the score of each grade with the average for the next lower grade, one finds that when the teacher reads the problems, 58.46 per cent of the seventh grade pupils excel the mean for the sixth grade. The largest

percentage in this case is that of the sixth grade in which 85.97 per cent of the pupils excel the mean for the fifth grade. When the problems are read by the pupils, only 55.9 per cent of the seventh grade pupils excel the sixth grade average, and 85.72 per cent of the sixth grade excel the fifth grade average.

Table III shows a comparison of the mean grade score on the test read by the teacher and on the test read by them. The children made consistently higher mean scores on the test when they read the problems than when the teacher read them. The differences range from 1.88 problems in the fourth grade to 4.22 in the fifth grade. These differences are reliable. The P. E. is sufficiently small in each case to indicate that one can always expect a higher score on the test when the problems are read by the pupils. It seems probable that much of the difference in scores on the two tests is caused by the fact that the child can reread the problem if he does not understand it, while if the teacher reads the problems, she does not repeat the reading; hence, he has no opportunity to get a problem if he fails to understand it at first.

TABLE III

AVERAGE SCORE, DEVIATION FROM THE AVERAGE, AND DIFFERENCE BETWEEN AVERAGES ON TESTS READ BY TEACHER AND TESTS READ BY PUPILS, GRADES IV, V, VI, AND VII

| GRADE | PROBLEMS READ BY THE TEACHER | | PROBLEMS READ BY THE PUPILS | | | |
|---|---|---|---|---|---|---|
| | M | P.E. dis. | M | P. E. dis. | Mp-Mt | N |
| IV | 7.71 ± .18 | 2.59 | 9.59 ± .25 | 3.46 | 1.88 ± .31 | 197 |
| V | 9.52 ± .19 | 2.71 | 13.74 ± .20 | 2.81 | 4.22 ± .28 | 199 |
| VI | 13.72 ± .20 | 2.64 | 17.24 ± .16 | 2.21 | 3.52 ± .26 | 179 |
| VII | 14.51 ± .21 | 2.52 | 17.65 ± .16 | 1.87 | 3.14 ± .26 | 137 |

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In Table IV, it is seen that the correlation coefficients between scores on the test read by the teacher and on the test read by the pupils ranged from .51 in the sixth grade to .688 in the fourth grade. The correlation coefficients between scores on test read by the teacher and scores on the Otis Test range from .485 in the fourth grade to .546 in the sixth grade. The correlation coefficients between scores on the test read by the pupils and scores on the Otis Test range from .446 in the sixth grade to .565 in the fifth grade. These coefficients are reliable as indicated by the probable error. The smallest coefficient, .446, has a P. E. of .041. This means that with any similar group of pupils, there is practically a certainty of a coefficient between scores on the test read by pupils and scores on the Otis Test of at least .322.

TABLE IV

COEFFICIENTS OF CORRELATION, COEFFICIENTS OF ALIENATION, PERCENTAGE OF IMPROVEMENT OF ESTIMATE, AND THE NUMBER OF CASES FOR TEST READ BY TEACHER, TEST READ BY PUPILS, AND THE OTIS ARITHMETIC REASONING TEST, GRADES IV, V, VI, AND VII

| TEST | | READ BY PUPILS | | | OTIS REASONING | | |
|---|---|---|---|---|---|---|---|
| TEST | Grade | r | Per cent of Imp. | N | r | Per cent of Imp. | N |
| Read by Teacher | IV | .688 ± .025 | 27.4 | 197 | .485 ± .038 | 12.6 | 186 |
| | V | .600 ± .031 | 20.0 | 199 | .546 ± .039 | 16.3 | 191 |
| | VI | .510 ± .037 | 14.0 | 197 | .524 ± .037 | 14.9 | 169 |
| | VII | .571 ± .039 | 17.9 | 137 | * | | |
| Read by Pupils | IV | | | | .490 ± .037 | 13.0 | 186 |
| | V | | | | .565 ± .033 | 17.9 | 191 |
| | VI | | | | .446 ± .041 | 10.5 | 169 |
| | VII | | | | * | | |

*No data available for seventh grade on Otis Test.

The percentage of improvement of estimate is small. This shows that each test has a moderate value for predicting scores on the two others. The smallest percentage of improvement is that found between scores on the test read by the pupils and scores on the Otis Test. This is 10.5 per cent in the sixth grade. The largest percentage of improvement is found when one test is read by the pupils and the other is read by the teacher, where the percentage is 27.4 in the fourth grade. The percentage of improvement of estimate necessary before a score on one test may be used for predicting scores on another is debatable. The lowest percentage, 10.5, does not yield a very large gain over a guess. An improvement of 27.4 per cent, however, is surely worthy of consideration.

*Comparison with Similar Study.* Sister Mary Immaculata made a study[4] of various reasoning tests which has considerable bearing on the present study. For brevity's sake, only the part of her findings relating to the Otis Arithmetic Reasoning Test will be considered here. Immaculata's study involved 338 children in grades IV, V, VI, and VII. The number of pupils in the different grades ranged from 40 to 99. Her study ascertained the relationship between scores made on Buckingham, Monroe, Otis, Stevenson,

[4]Sister Mary Immaculata, A Critical Study of Arithmetic Reasoning Tests,—The Catholic University of America, *Educational Research Bulletins*, Volume II, Number 6, June, 1927.

and Stanford reasoning tests in arithmetic. The correlation coefficients in which the Otis Test is involved are quoted below:[5]

| *Tests* | *Grade* | *Correlation* |
|---|---|---|
| Otis and Stanford | VII | .615 ± .068 |
| | VI | .417 ± .089 |
| | V | .491 ± .082 |
| | IV | .417 ± .089 |
| Otis and Buckingham | VII | .416 ± .083 |
| | VI | .512 ± .080 |
| | V | .456 ± .090 |
| | IV | .398 ± .074 |
| Otis and Monroe | VII | .625 ± .065 |
| | VI | .428 ± .087 |
| | V | .562 ± .073 |
| | IV | .587 ± .057 |
| Otis and Stevenson | VII | .405 ± .089 |
| | VI | .408 ± .089 |
| | V | .642 ± .063 |

It is to be noted that the Immaculata study found correlation coefficients as follows:

.417 to .615 for Otis and Stanford,
.398 to .512 for Otis and Buckingham,
.428 to .625 for Otis and Monroe, and
.405 to .642 for Otis and Stevenson.

In this study the correlation coefficients range as follows:
.485 to .546 for Otis and test read by the teacher,
.446 to .565 for Otis and test read by the pupils, and
.510 to .688 for test read by teacher and test read by the pupils.

It is noticeable that each of these tests has a more constant relationship with the Otis test than has either of the tests reported by Immaculata. It is also noticeable that the coefficient of correlation is not so low in either case studied here as it is in each of those reported by Immaculata.

*Educational Implications.* It is apparent that there is considerable difference between the elements measured by each of these two tests and the elements measured by the Otis test. It is also apparent that there is considerable difference between the elements measured by the two tests. There is, however, a reasonably high and almost constant relationship between scores made on these tests and scores made on the Otis test. These relationships are as high and apparently more constant than the relationship between scores on the Otis test and scores on either of the tests studied by Immaculata.

[5]Ibid, page 28.

The findings justify one in saying that there is a distinct need of giving instruction in the schools in problem solving with the two types of procedures tested in this study. It is apparent that this type of problem solving should be developed if one is justified in saying that children need to learn how to solve problems that are presented to them in the ways mentioned here. A casual observation of the actual arithmetical problems that arise in one's everyday activities indicates that by far the majority of the problems are presented in an oral manner and solved without the use of paper and pencil. However, since there is no definite evidence available on this point, any statement made on the subject is mere speculation.

*Additional Study Needed.* Further study along the lines undertaken here should be made. The findings will be of value to those interested in the field of elementary education. Some of these studies may relate to the following problems:

1. How do the grades differ in ability to solve oral problems that are more difficult than those presented in this study?

2. How do the grades differ in ability to solve problems when the problems are arranged in a scale ranging from very simple to very difficult ones?

3. How do the scores on the two types of tests in numbers 1 and 2 correlate with scores on several widely used arithmetic tests?

4. What per cent of the problems solved in the everyday experiences of people arises in an oral situation and is solved without the use of paper and pencil?

# EDITORIALS

## EDUCATIONAL COMPENSATIONS OF THE DEPRESSION

The schools, especially the public schools, have received and are receiving much benefit from the depression. More children are in school than ever before. Children who would be leaving school for work if they could get it, are continuing their education. The attitude of pupils and patrons is more earnest than it was a year or so ago. Many rather frivolous people seem to have discovered that life is not wholly composed of "beer and skittles." Even the teachers are working more seriously at their jobs, being not unmindful of the fact that there are others equally prepared for the work who are quite anxious to have their places.

Eager and industrious pupils and teachers go far toward making good schools. Better teaching is not only possible, but probable. More attention to the curriculum is necsssary to take care of added pupils whose needs are pressing. The very presence of the depression emphasizes the need for change and adjustment of school courses. The need for integration of school and community is apparent. Progress along these lines is easier than it was when everything was "booming," and the idea prevailed that the schools should "leave well enough alone."

Even the financial difficulties, serious as they are, bring some blessings. Some extraneous enterprises of the schools that have been taking time and money that should belong to the education of school children, are being forced out of the budget. More careful organization and administration is being forced upon school authorities. Untrained and incompetent administrators are being dropped. The organization and administration of schools is becoming leaner, and more useful. Real progress in public education is being forced upon us. A little forethought and effort will mitigate the present ills and discomforts (which are receiving plenty of attention without being mentioned here) and speed the development of substantial educational gains. All told, thanks to the depression, every school teacher and administrator may reasonably expect to make this the best year in many for educational growth for themselves, their pupils, their schools, and their communities—N. F.

## CONTENT AND METHOD

Many educators are suggesting that college teachers and university professors should be engaged to teach college students only after they have had some special preparation in methods of teaching. State boards of education

have fixed standards with the number of hours of education required of teachers before they can be employed in high schools. Colleges and universities are destined to reach some similar standard. Prospective high school teachers often get very bad methods by imitating their college professors. Old-style teachers are still to be found who lecture their pupils "to death" because they know nothing of better modern methods. When young high school teachers are required to have earned 198 college credits, twenty-seven of which are in education, they are not as likely to do harmful teaching, and the proportion of credits in education is not too great. Child psychology is yet too little understood by those out of harmony with modern education. To say that anyone who has a knowledge of subject matter is, therefore, qualified to teach, is a fallacy long since exploded. A college president recently said: "Many college and university faculties could have some first-class educational funerals to good advantage, provided their places are to be filled by those trained with a fair proportion of education and modern methods."—K. C. D.

## PARALLEL VS: CONVERGING

"Parallel" is a word which smacks of the campus. In academic, especially undergraduate circles, this word has a connotation peculiarly its own. So used "parallel" has to do with assigned reading in connection with a course or courses of study. Now certainly no one will gainsay the far-reaching values of or the fundamental necessity for reading not to mention its contemporaneous joys and its abiding satisfactions. "Reading maketh the full man," says Bacon, "and if he read little he had need have much cunning to seem to know that he doth not." The point herein suggested is not for a moment to undervalue, underestimate or minimize reading—that double track trunk line heavily freighted with raw materials for mind enrichment and the building of ideals. The question has rather to do with the word "parallel reading." Should reading, for example, "parallel" a course or fit into, supplement and further the aim and purpose of the course?

That parallel lines never meet is an axiom. On the other hand, that converging lines tend to meet is equally axiomatic. But what a name—"converging reading!" When would such a clumsy, awkward term ever crash the iron gates of convention? It is the idea, however, the reality rather than the symbol, the fact in preference to the name. In other words, would the effectiveness of reading tend to be enhanced if such reading could be directed to bear more definitely upon and to fit more appropriately into the end which the instructor through classroom procedure is striving to attain? Furthermore, would such emphasis tend on the one hand to clarify and accentuate classroom aims and objectives and on the other make reading thus assigned more meaningful, productive, stimulating and thought-provoking?

Parallel reading is apt to be measured and valued quantitatively, converging reading qualitatively. Which is the more fruitful?—L. W. C.

## THE SMALL SUPERINTENDENCY—A RESPONSIBILITY AND AN OPPORTUNITY

The majority of the school systems in the United States are small: in fact so small that the individual who serves as superintendent must of necessity perform almost alone all of the tasks of administration and supervision. He enrolls and classifies pupils, keeps all records, makes the budget, revises the curriculum, plans for a new building, keeps financial accounts, purchases supplies, recommends teachers, hires and fires janitors, oversees necessary repairs, improves instruction, informs the public of the work of the schools, represents the schools in community interests, etc. That is, he does all these things and more if they are done at all.

This situation bears a direct relationship to the training which is necessary for the superintendent in the small system. In the large system it is possible, because of the complexity of administrative duties to secure those who have special training for a particular job. Training in other administrative tasks outside his own is not vitally necessary, for others in turn with special training may be secured. In the small school system, on the other hand, if the many and varied administrative and supervisory duties are preformed efficiently, one individual, the superintendent, must have the wide, broad and at the same time intensive training necessary for the effective performance of all the administrative tasks.

Such a situation should serve as a challenge to those who are presiding over small school systems or who hope to do so. At present many in such positions have no training, others a small amount, only a few can be said to be fully prepared. Yet the boys and girls whose opportunities for necessary training are dependent to large measure upon the effectiveness of administration are as worthy as any to be found in the larger school systems.

The responsibility of the superintendent in a small system is clear. He must, if he would administrate effectively, secure the broadest and most intensive training available. His opportunity is equally clear. By preparing himself to perform his tasks effeciently, he opens the door of opportunity to those entrusted to his care and causes the school system to operate effectively in all of its various parts.

If the school system of America is to perform well and achieve its objectives, the superintendents who preside over our smaller systems must be those outstanding in training, superior in personal qualities, and who believe their job the most important in the world.—W. D. C.

# THE NEW BOOKS ON OUR SHELVES

[The reviews, most of them signed, are by appropriate members of the Faculty of George Peabody College for Teachers. Our limited space necessitates concise notices—brief, pointed, thoughtful comments, without elaboration.]

*Introductory Mechanical Drawing.* By Albert A. Lacour and Glenn N. Shaeffer. Milwaukee: The Bruce Publishing Company, 1931. pp. 23.

This twenty-four page pamphlet is an elementary text in mechanical drawing with Drawing procedure, Shape description, and Size description. It is written for students of junior high school age where a limited time is devoted to the subject. T. T. G.

*Two Times Two Is Four.* Adapted from the Swedish of Zacharias Topelins by Vera C. Himes. New York: Thomas Y. Crowell Company, 1931. Pp. 64.

A delightfully whimsical story for very young children. N. F.

*Jean and Fanchon: Children of Fair France.* By Virginia Olcott. New York: Silver, Burdett and Company, 1931. Pp. viii + 168.

A series of stories or incidents in the lives of two French children. The stories are interesting and well told, giving sympathetic insight into French life. Of about fifth grade reading difficulty. N. F.

*Introduction to the Use of Standard Tests* (Revised Edition). By Sidney L. Pressey and Luella Cole. New York: World Book Company, 1931. Pp. iii + 266.

This is simply a revision of the older text, in order to bring the discussions up to date. Like the older book, this revision is quite elementary, but that is apparently one of its greatest strengths, since it can be used so adequately as a text in a strictly beginners course. It has an excellent glossary for beginning students. P. L. B.

*Health Horizons.* By Jean Broadhurst and Marion Olive Lerrigo. New York: Silver, Burdett and Company, 1931. Pp. i + 44.

Health Horizons, a memorial to Emma Dolfinger from her friends, reviews contributions to Health Education from the field of history and science in abstract form, giving authentic sources of material and modern thought in the field of scientific research. The bibliography is valuable as source material in Health Education. A. B. P.

*Poems for Enjoyment.* By Elias Lieberman. New York: Harper Brothers, 1931. Pp. v + 510.

I read this somewhat massive anthology with much pleasure and admiration. Many of the selections are quite new to the reader of collections; the others are seldom trite. B. R.

*Fabrics and Dress.* By Lucy Rathbone and Elizabeth Tarpley. New York: Houghton Mifflin and Company, 1931. Pp. ix + 430.

This text is organized on the unit basis for use in high schools of the 7-4, 8-4, or 6-3 plan. The units which are thought provoking throughout are so arranged that the text is easily adapted to any high school course of study. The emphasis is on selection, use and care of clothing and fabrics.

It should be a welcome text to the home economics teachers of today. M. L. N.

*Factors Influencing the Choice of Courses by Students in Certain Liberal Arts Colleges.* By Helen Foss Weeks. New York: Columbia University, 1931. Pp. i + 62.

This is primarily a study of the liberal arts curriculum though it may also be called a study of student personnel. The attitudes of students toward courses are obtained from questionnaires and personal interviews. It is found that three-fourths of college courses are taken by students because of college requirements, because of occupational interests, or interest in subject matter. College requirements are responsible for 40% of the courses while the influence of the teacher accounts for only 4%. Recommendations for curricular revision are made on the basis of the findings. J. R. R.

*Manual for Expressing Educational Measures as Percentile Ranks.* By Francis C. Buros and Oscar K. Buros. Yonkers: World Book Company, 1930. Pp. 27.

The authors describe a special day of ranking scores of a group so that percentile ranks can be read directly from a table included in the pamphlet. Finding percentile ranks of scores thus becomes a matter of routine that can be followed with speed and accuracy. D. H. C.

*Mental and Interest Tests.* By LEA HAMILTON KING. New York: Columbia University, 1931. Pp. 1 + 124.

This is a doctor's dissertation which has a rather dual type of problem. The interest test is quite subjective, but no more so than others bearing on the topic. The study should be reviewed by those specializing in secondary education and school administration. P. L. B.

*The Bearing of Certain Personality Factors Other Than Intelligence on Academic Success.* By HENRY T. TYLER. New York: Columbia University, 1931. Pp. v + 88.

The author thinks that intelligence is more significant than personality in the academic realm. This depends on the true validity of his personality measure, a thing which may be questioned. It is a suggestive study, however, and merits consideration from those in experimental education. P. L. B.

*Psychology of Exceptional Children.* By NORMA V. SCHEIDEMANN. New York: Houghton Mifflin Company, 1931. Pp. i + 520.

This is a significant contribution in the field of chemical psychology. Much valuable material is presented and reviewed and while certain positions taken by the author may be questioned, the book does meet a need in the literature on the subject. P. L. B.

*Problems in School Supervision.* By GEORGE C. KYTE. Boston: Houghton Mifflin Company, 1931. Pp. xiv + 214.

A series of thirty-three problems of supervision. The problems deal largely with matters of organization and techniques of supervision. The material presented is specific, and the bibliographies are helpful. This series of problems should be particularly helpful to those who are teaching courses in supervision and who are desiring supplementary material to accompany the general text already available. N. F.

*The Birch Bark Roll of Woodcraft.* By ERNEST THOMPSON SETON. New York: A. S. Barnes and Company, 1931. Pp. xii + 268.

A manual of games, dances, songs, and handicrafts that will prove very helpful for campers and for those working with Boy Scouts or Campfire Girls. N. F.

*How to be Interesting.* By PROFESSOR ROBERT E. ROGERS. Boston: L. C. Page & Company, 1931. Pp. xii + 170.

This is a series of informal talks by a professor of English who seems to have succeeded in making himself interesting. While in no sense a formal outline or a complete compendium for speakers, it should prove helpful to all who speak or talk in public. N. F.

*Grammar in Action.* By J. C. TRESSLER. New York: D. C. Heath and Company, 1931. Pp. xii + 404.

An excellent text for teaching the application of the fundamentals of grammar. The phases of grammar presented are selected on the basis of the best available studies of English usage. The presentation is good and exercises are provided, with answers in the back of the book, making possible the use of the "contract" system. The emphasis on sentence structure is worthy of note. N. F.

*Uncle Remus.* By JOEL CHANDLER HARRIS. New York: D. Appleton and Company, 1931. Pp. xxiii + 283.

An edition of this popular and well known book especially prepared for use in schools. The notes will prove helpful to those who find difficulty in understanding the dialect. The exercises are not particularly helpful. N. F.

*Making the Most of High School.* By CLYDE M. HILL and RAYMOND D. MOSHER. New York: Laidlaw Brothers, 1931. Pp. v + 288.

This is a Guidance book, written primarily to be put into the hands of the junior high school pupil. It is simple, readable, and easily understood. It is a valuable addition to the literature in this field and especially helpful to people who are seeking literature written from the stand-point of the pupil. J. R.

*Modern Business Law.* By JAY FINLEY CHRIST. New York: The Macmillan Company, 1930. Pp. xiv + 612.

States in clear and simple language the leading facts and principles of law that control our everyday business life. Well written. O. C. A.

*Capital Outlay in Relation to a State's Minimum Educational Program.* By FOSTER E. GROSSNICKLE. New York: Columbia University, 1931. Pp. iii + 65.

The purpose of this study is to develop a technique for equalization for capital outlay purposes; debt service is the measure used for the burden. The author has done in an efficient, rather statistical manner what he has set out to do. It is another contribution to the equalization of educational opportunity and burden. B. R. S.

*Students' Marks in College Courses.* By JOHN E. BOHAN. Minneapolis: University of Minneapolis Press, 1931. Pp. iii + 133.

This is a valuable study of the variabilities and defects in the giving of "school marks" by higher educational institutions. The work is based chiefly on an investigation of the marks given in various schools and departments of the University of Minnesota over a period of three years. Modern objective, achievement and intelligence test-methods were employed. The book closes with suggestions for the improvement of marking systems. J. P.

*The Influence of Training on Changes in Variability in Achievement.* By HOMER B. REED. Albany: Psychological Review Company, 1931. Pp. 1+ 59.

This study is a continuation, with additions of new data, of the study published by Peterson and Barlow in 1928, who concluded that as a general rule practice reduces individual differences. The results agree with this conclusion, and show that the opposite results usually obtained before 1922, by Thorndike and others, were based on a failure to discriminate between average attainment data (which begin with small scores and gradually increase) and data in the form of errors made or time consumed in doing a given piece of work (which begin with large scores and decrease rapidly on an absolute scale, as first pointed out (in 1917) by Peterson. J. P.

*Education and the Philosophy of Experimentalism.* By JOHN L. CHILDS. New York: The Century Company, 1931. Pp. vii + 264.

This book in the first volume of a new series to be called The Century Studies in Education, edited by W. L. Uhl. The book is a critical examination of the philosophical works of Pierce, James, and Dewey, the founders of "pragmatism" or "experimentalism," in America, and of their ideas on education. It will make interesting reading for the more thoughtful teachers and citizens, whether or not they know the writings of these influential thinkers.

*Progress in Adjusting Differences of Amount of Educational Opportunity Offered Under the County Unit Systems of Maryland and Utah.* By L. JOHN NUTTALL, JR. New York: Bureau of Publications, Teachers College, Columbia University, 1931. Pp. v + 105.

An attempt to show in objective terms the effect of the county unit plan of school administration on educational inequalities within the state. The data is clearly presented. The fact that only two states are considered makes it difficult to feel certain that the trend shown is due entirely, or even largely, to the single factor of county unit administration. N. F.

*The Assembly in the Teachers College.* Trenton (New Jersey). Studies in Education, Number One. A twenty-two page pamphlet telling why New Jersey State Teachers College changed morning Assembly from five to two sessions a week. L. W. C.

*Modern Chemistry.* By CHARLES E. DULL. New York: Henry Holt and Company, 1931. Pp. xii + 776.

Bringing a widely used high school text down to date; with emphasis on industry. H. A. W.

*An Introduction to Organic Chemistry.* By ROGER J. WILLIAMS. New York: D. Van Nostrand Co., 1931. Pp. iii + 585.

Second edition of a practical college text, that is generous with structural formulas. H. A. W.

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*Educational Measurement in the High School.* By C. W. ODELL. New York: The Century Company, 1930. Pp. 641.

This is an important book in the measurement field. The author has grouped the various high school tests by subjects in a manner that makes the material easy to use. Definite information regarding norms, reliability, price, and publisher is given for each test. Enough information is given about each test to enable the high school teacher or principal to decide its appropriateness for a given purpose. The sections on the selection of tests, and general uses of tests, non-standardized tests, and statistical methods are concisely written without sacrificing clarity. C. W. K.

*Furniture Boys Like to Build.* By RICHARD SHAVER. Milwaukee: The Bruce Publishing Company, 1931. Pp. 216.

The author of this book has brought together a choice collection of selected furniture projects boys like to build. They are suitable for construction in both junior and senior high schools. Each project is shown by a clear photograph and by an accurate working drawing. Complete directions have been worked out for the construction of each piece of furniture calling for hand tool and machine tool instruction. L. L. G.

*General Metal Work.* By ALFRED B. GRAYSHON. New York: D. Van Nostrand Company, 1930. Pp. viii + 206.

A fundamental text in general metal work including machine work, sheet metal and some cold iron work, worked out for junior and senior high school work. It is intended that this book supply the necessary information and instruction needed in the general shop. The projects are well graded and instructions are given by the project operation method. L. L. G.

*Coloring, Finishing, and Painting Wood.* By A. C. NEWELL. Peoria: The Manual Arts Press, 1930. Pp. 419.

An excellent text and reference book on stains, fillers, varnishes, lacquers, paints and painting. It is not too technical for senior high school pupils of Industrial Arts.

It contains a practical treatment of the mixing and application of finishes used in school shops. L. L. G.

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*A Gateway to Music.* By WILTON W. BLANCKE AND JAY SPECK. Boston: D. C. Heath and Company, 1931. Pp. v + 178.

A new book in a crowded field. Of particular aid to those already interested in music. D. R. G.

*Plane Geometry Work Book.* By THEODORE HERBERG AND SINCLAIR J. WILSON. Boston: D. C. Heath and Company, 1931.

An excellent work book providing an abundance of drill material for plane geometry. F. L. W.

*Standard Service Arithmetics, Grades One and Two.* By J. W. STUDEBAKER, F. B. KNIGHT AND W. C. FINDLEY. Chicago: Scott, Foresman and Company, 1929. Pp. 154.

An attempt to give for grades one and two "a definite statement of the topics to be taught and the content of each topic and a carefully balanced order in which the topics and teaching units are to be taught and reviewed" as well as time schedules and definite teaching procedures. Very well worked out, but one wonders if such work cannot be carried too far. F. L. W.

*Introductory Algebra.* By ALAN JOHNSON AND ARTHUR W. BELCHER. Chicago: Laurel Book Company, 1930. Pp. 407.

A well written text, which makes excellent use of arithmetic and geometry as aids in presenting algebraic facts. An abundance of exercises. F. L. W.

*Fabrics and Clothing.* By SARA MACBRIDE AND ELLEN BEERS MCGOWAN. New York: The Macmillan Company, 1931. Pp. viii + 225.

In this book the emphasis is on the fabrics which high school girls see every day. Technical terms and details of manufacture are eliminated. Study suggestions which should serve to link home and class work follow each chapter. M. L. N.

*Mathematics, Seventh School Year.* By FRED ENGELHARDT AND MARY L. EDWARDS. New York: D. Appleton and Company, 1931. Pp. xvi + 232.

A carefully worked out junior high school series. Well illustrated, numerous exercises, appears to be very teachable. F. L. W.


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